

# MOTOR AGE

Vol. XLIV  
Number 4

PUBLISHED WEEKLY AT THE MALLERS BUILDING  
CHICAGO, JULY 26, 1923

Thirty-five Cents a Copy  
Three Dollars a Year

## America's Higher Priced Cars

Leaders in their class. Comparison of their major specifications reveals why Dodge Brothers Chassis is so enthusiastically endorsed by the motoring public.

	Cadillac	Lincoln	Locomobile	Marmon	Pierce Arrow	Peckard Twin Six	Jordan
Factory Price	\$2885	\$3800	\$9600	\$3185	\$5250	\$3850	\$1675
Boston Price	\$3072.32	\$4022	\$10,010	\$3515	\$5550	\$4250	\$1850
R. P. M. at 30 M. P. H. in direct drive Engine	1374	1399	1096	1292	1307	1258	1391
" Wheels	305.4	305.4	288.5	315.	305.4	288.5	315.12
Valve Location	L	L	T	O	T	L	L
Gear Ratio	4.50	4.58	3.85	4.10	4.29	4.36	4.42
Car Weight	4025	4290	5330	3800	5000	4746	3015
Brake Location	R. W.	R. W.	R. W.	R. W.	R. W.	R. W.	R. W.
Brake equalized	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Square inches of brake lining in Service Brakes	270.0	298.5	291.7	216.0	332.3	265.4	173.
Square Inches of service brakes per 100 lbs. weight	6.7	6.9	5.4	5.6	6.6	5.6	5.7
How cooled	Positive Pump	Positive Pump	Positive Pump	Positive Pump	Positive Pump	Positive Pump	Positive Pump
Boston. Parts cost. One front left fender and spring	\$45.00	\$56.80	\$48.00	\$56.73	\$87.15	\$49.50	\$28.25
Clutch	M. D.	M. D.	M. D.	M. D.	M. D.	M. D.	M. D.
Enclosed Clutch	Yes	Yes	No	Yes	Yes	No	Yes
Enclosed Propeller Shaft	No	Yes	No	Yes	Yes	No	No
Fenders	Two pieces	One piece	One piece	One piece	One piece	One piece	One piece
Running Board Supports	3	4	3	Integral with frame	4	3	3
Rear Wheel Spoke Construction	Reinforced	Reinforced	Reinforced	Reinforced	Reinforced	Reinforced	Reinforced
Battery Location	On frame	On frame	On frame	Under seat cushion	On frame	On frame	Under seat cushion
Axle Housing Bolted	No	No	No	Yes	Yes	No	No
" " Trussed	No	No	Yes	No	Yes	No	No
Chassis Lubrication	Pressure Grease Gun	Pressure Grease Gun	Pressure Grease Gun	Pressure Grease Gun	Pressure Grease Gun	Pressure Grease Gun	Pressure Grease Gun

## What are the Seven Best Built Motor Cars in America?

C. S. Henshaw, Dodge distributor in Boston, decided his salesmen didn't know enough about automobiles.

So he condensed the specifications of every car built, classifying them not according to price but according to quality.

Here is the group which Mr. Henshaw designated "America's Higher Priced Cars."

Note the Jordan price. Then note that every construction specification of the Jordan is found in one or more of America's highest priced cars. This will be interesting to many salesmen who have formed the habit of saying to prospective buyers, "Yes, we have a car almost the same as the Jordan."

*Edward S. Jordan*  
President  
Jordan Motor Car Company  
Cleveland, Ohio

# BLACK & DECKER

## ANNOUNCE A FURTHER REDUCTION IN PRICES

OPERATING under the policy of giving the public the greatest value per dollar we are pleased to announce a further reduction in prices of standard Black & Decker electric tools as follows:

	Old Price	Reduction	NEW PRICE
3/8-inch Portable Electric Drill..... Heavy Duty	\$ 82	\$ 7	\$ 75
1/2-inch Portable Electric Drill..... Heavy Duty	\$100	\$10	\$ 90
5/8-inch Portable Electric Drill	\$105	\$10	\$ 95
9/16-inch Portable Electric Drill	\$105	\$10	\$ 95
7/8-inch Portable Electric Drill	\$125	\$15	\$110
No. 1 Electric Screwdriver.....	\$ 65	\$17	\$ 48
No. 2 Electric Screwdriver.....	\$ 80	\$12	\$ 68

Other Black & Decker Electric Tools were reduced in price earlier in the year as follows:

	Old Price	Reduction	NEW PRICE
1/4-inch Portable Electric Drill	\$39	\$11	\$28
1/2-inch Special Port. Elec. Drill	\$85	\$17	\$68
Bench Drill Stand .....	\$33	\$ 5	\$28
Post Drill Stand .....	\$36	\$ 4	\$32
6-inch Electric Bench Grinder	\$56	\$18	\$38

The well known Black & Decker quality has been maintained in spite of the reductions; in fact many improvements have been made which make these tools better than ever. The reductions are made possible by reason of the ever increasing demand for Black & Decker tools, which has increased our volume thereby reducing our costs, and the saving is being passed on to you.

Write for miniature catalogue.

**THE BLACK & DECKER MFG. CO.**

Towson Heights, :: :: Baltimore, Md., U. S. A.

Branch offices and service stations carrying complete stocks of parts and operated by factory trained men located in

Boston  
New York  
Atlanta

San Francisco  
Philadelphia  
Kansas City

Detroit  
Chicago  
Cleveland

Canadian Factory, Lyman Tube Bldg., Montreal, P. O.



BACKGROUND PATENT PENDING  
BLACK & DECKER MFG. CO.



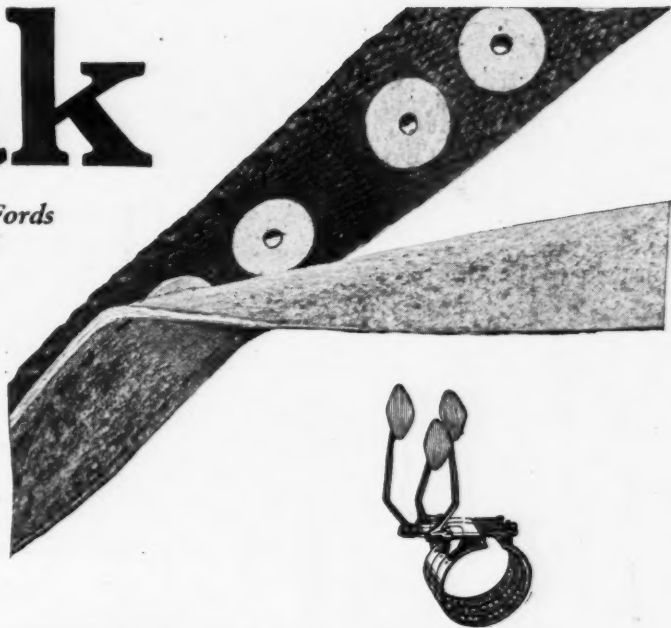
# Feltbak

The Transmission Lining for Fords  
that removes the cause of  
chatter and vibration



\$3

Per Set  
In Canada  
\$3.85



## "What Makes My Ford Shiver and Shake?"

Every Ford owner knows that his Ford is all right, but he does not know what makes his Ford chatter when he uses the pedals.

### It's the Transmission Lining

Don't blame the Ford if it chatters and shivers, when you stop, start and reverse. The Ford isn't "just made that way." But it "gets that way," when the transmission linings have become hard, glazed and charred. They grab and slip and shake and shiver the bolts and nuts loose. This will injure your Ford and cost you rear axle and transmission repairs.

### FELTBK Stops Ford Chatter

You can get rid of even the slightest tremble and quiver by using the correct transmission lining. Feltbak has cushioning felt; cork for friction; oil holes for lubrication and smoothness. It is a scientifically correct lining designed for the Ford transmission. Gives superior service and long mileage at very small expense. Sells for only \$3.00—cost of installation no more than for ordinary lining.

The ordinary lining has no felt cushion to soften the brake action—no corks to give the correct friction and no means of supplying oil under pressure to the lining surface.

More Ford owners are buying Feltbak than ever before. Hundreds of thousands of sets now in use. Its principle is right. It's been proven by years of actual service.

Get a set of Feltbak. Its the only lining that has the Feltbak principle. Try Feltbak and you'll never go back to the old untreated plain lining that has caused you so much trouble.

Ask your dealer for Feltbak; he has it or can get it immediately from any wholesale house.

### Advance Automobile Accessories Corporation

1721 Prairie Avenue

Manufacturers

Dept. 963, Chicago, Ill.

## How Feltbak Works

Feltbak is an advancement over the cork-in-fabric idea. The corks are for friction. The oil holes in the corks are for lubrication under pressure. The feltbacking holds the corks in place, cushions brake action and acts as an oil reservoir.

**ADVANCE EQUIPMENT**  
is recognized from coast to coast as the finest made. When you buy an article of our manufacture for your automobile, you are sure that it is the best article for the purpose which money and manufacturing skill can produce.

<p><b>ADVANCE CORK FELTBK TRANSMISSION LINING for FORDS</b></p> <p>Lubricates itself—softens brake action. Makes Ford most responsive, easiest car to handle. Designed to overcome shivering and shaking.</p>	<p><b>RED STAR TIMER for FORDS TRUCKS and TRACTORS</b></p> <p>The Scientifically Correct Timer for Fords. Roller of 100 point carbon tool steel. Race of bone-hard fibre.</p>	<p><b>WHITE STRIPE TRANSMISSION LINING for FORDS</b></p> <p>Woven and treated for Heavy Duty Fords—Trucks, Commercial Cars</p>	<p><b>ADVANCE ASBESTOS BRAKE LINING for LARGER CARS</b></p> <p>Made from genuine asbestos for use on larger cars. Buy it for Better Brakes and Longer Wear.</p>	<p><b>WHITE STRIPE FAN BELT for FORDS and LARGER CARS</b></p> <p>Outwears six ordinary belts. Never needs adjustment. Stretches and "Comes back" Made for Fords &amp; Larger Cars</p>	<p><b>DUPLEX SHOCK ABSORBERS for FORDS</b></p> <p>The Shock Absorber for rough roads. Eliminates bounce, side-sway, rebound, vibration. Looks like a part of the car.</p>
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# ADVANCE EQUIPMENT

*"Every Product the Best of its Kind"*



Patented  
March 20, 1910  
May 2, 1922

OIL-REGULATING TYPE, \$1.00 EACH

One to a piston  
Up to and including 5 in. diameter  
COMPRESSION TYPE, 25c and up

## As Simple As They Are Effective!

**N**O other piston rings are like PERFECT CIRCLE Oil-Regulating Rings! The simple, patented principle by which they use all the oil necessary—but no more—and return the surplus oil to the crankcase, is an exclusive PERFECT CIRCLE feature.

Car owners immediately understand the difference between PERFECT CIRCLES and ordinary rings—and why PERFECT CIRCLES stop oil-pumping in even the worst "oilers".

One big Middle Western jobber who discarded three other lines in favor of PERFECT CIRCLES, says:

"We sell some things one day—other things other days—but we sell Perfect Circle Piston Rings every day our doors are open!"

And not alone the rings, but the powerful merchandising policy behind them—make PERFECT CIRCLES the most profitable line for you to sell.

Indiana Piston Ring Company, Hagerstown, Indiana

Harkrader & Harkrader: Western Sales Agents  
1603 S. Michigan Ave., Chicago



# PERFECT CIRCLE Oil-Regulating Piston Rings

# MOTOR AGE

Reg. U. S. Pat. Off.

Published Every Thursday by

THE CLASS JOURNAL COMPANY

MALLERS BUILDING

59 East Madison Street, CHICAGO

Vol. XLIV

Chicago, July 26, 1923

No. 4

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United States, Mexico and U. S. Possessions.....	\$ 3.00 per year
Canada.....	5.00 per year
All Other Countries in Postal Union.....	6.00 per year
Single Copies .....	.35 cents

Subscriptions accepted only from the Automotive Trade  
Entered as Second Class Matter Sept. 19, 1899, at the Post Office  
at Chicago, Ill., under Act of March 6, 1879.

## A National Quick-Delivery System

A great chain of Goodrich branches, depots and warehouses in every important center gets you the sizes you need in Goodrich Tires and gets them there fast.

What this service means is forcibly shown in a recent letter from a California dealer:

*"Since handling Goodrich and having the benefit of the District Warehouses or being able to draw on the local branch for emergency or fill in stock, I have cut my inventory to bed rock and yet am taking care of my trade better than ever."*

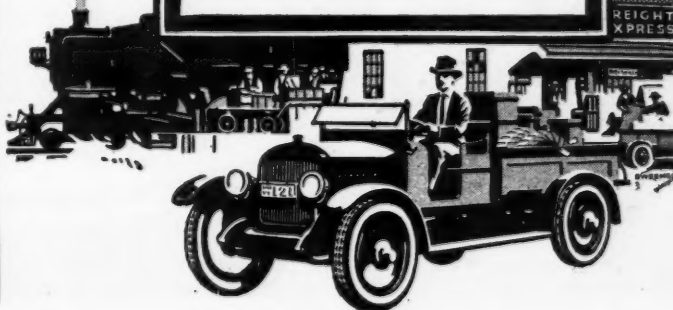
Golden Gate Tire Shop  
Medford, California

But don't overlook this point. The best merchandising and delivery systems in the world won't give you other than temporary advantages unless they have Dependable Quality back of them. Goodrich dealers not only get business but hold it because of the year in and year out superior service value of Goodrich Tires.

THE B. F. GOODRICH RUBBER CO.  
Established 1870

# Goodrich TIRES

"Best in the Long Run"





"I am  
Satisfied"



LIPKE & NEAULT COMPANY  
BESSEMER, MICHIGAN

May 10th, 1923.

Print Motor Car Company,  
Oldsmobile Distributors for Wisconsin,  
Milwaukee, Wisconsin.

Attention: Mr. L.D. Print.

Gentlemen:

I have handled the Oldsmobile line of cars and trucks for a period of five years and wish to say that I am entirely satisfied both with the car and our connection with you.

The Oldsmobile 43-A Four in its price class is a very economical car, making over 15 miles to the gallon of gasoline and as high as 1000 miles to the gallon of oil, although we recommend a change of oil every five or six hundred miles. The service work done on the 43-A is negligible and is hardly worth mentioning.

The 47 Light Eight has given wonderful service, both in upkeep and economy. The general feeling has been that an eight cylinder car is a very expensive car to keep up, but I am here to say that the 47 Eight will make as high as 14 to 15 miles to the gallon, and the oil consumption being the same as the 43-A.

I am always ready to make a complaint when it is necessary, so I think I surely ought to give you credit that is coming to you.

Yours truly,

LIPKE & NEAULT COMPANY

*Levin J. Neault*

# OLDSMOBILE

Evidently the great majority of automobile dealers are not satisfied with their progress, because during 1922 the records show that 25% of them went out of business.

In contrast to this startling condition, Oldsmobile dealers are long-lived. Many have been with us since the days of the old "curved dash" Oldsmobile. When a dealer writes "I am satisfied," there is a world of meaning in it for the dealer whose factory connection is an unhappy one.

OLDS MOTOR WORKS, LANSING, MICHIGAN  
Division of General Motors Corporation

**Oldsmobile**  
A PRODUCT OF  
GENERAL MOTORS

# Cashing In On Good Will

The Studebaker prospect does not question Studebaker *quality*. He knows that the materials and workmanship in Studebaker cars measure up to the highest standards known to the automobile industry.

He does not question the *value* of Studebaker cars. He knows that substantially better intrinsic values cannot be obtained at any price.

He does not question Studebaker *dependability*. Owners everywhere testify to the splendid satisfaction rendered by Studebaker cars.

The Studebaker dealer, therefore, does not have to take up time to disarm sales resistance. And having a complete line of three six-cylinder models in twelve body types he is in a position to deliver to the prospect the car that will exactly suit his requirements.

Add to these advantages the resources and facilities of Studebaker and Studebaker's 71-year reputation for honest value and integrity and it is easy to understand why the Studebaker line is so highly regarded by dealers, bankers, and the industry in general.

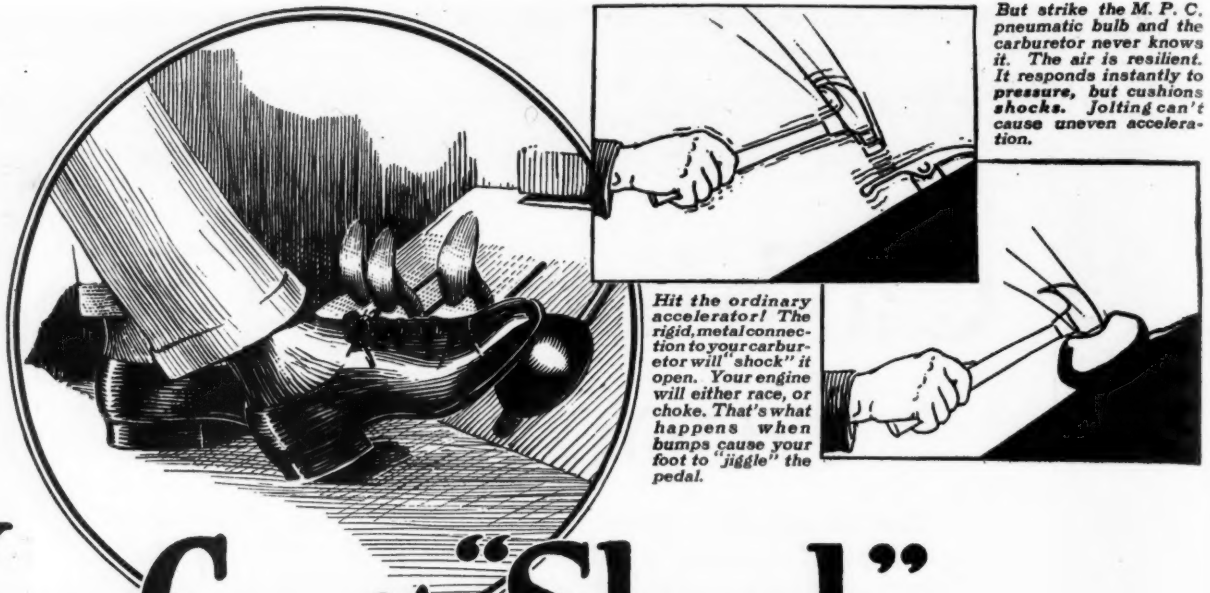
MODELS AND PRICES—f. o. b. factory					
LIGHT-SIX 5-Pass., 112" W. B., 40 H. P.		SPECIAL-SIX 5-Pass., 119" W. B., 50 H. P.		BIG-SIX 7-Pass., 126" W. B., 60 H. P.	
Touring.....	\$995	Touring.....	\$1350	Touring.....	\$1750
Roadster (3-Pass.).....	975	Roadster (2-Pass.).....	1325	Speedster (5-Pass.).....	1835
Coupe-Roadster (2-Pass.).....	1225	Coupe (5-Pass.).....	1975	Coupe (5-Pass.).....	2550
Sedan.....	1550	Sedan.....	2050	Sedan.....	2750

THE STUDEBAKER CORPORATION OF AMERICA  
South Bend, Indiana

# STUDEBAKER



T H I S   I S   A   S T U D E B A K E R   Y E A R



# You Can't "Shock" the carburetor open

This is one of the biggest advantages of the New Air Control. It absorbs shocks. You know how your engine races and jerks when a sudden bump causes your foot to thump the metal accelerator pedal. The rigid metal connection conveys the shock direct to the carburetor. *That can't happen with an M. P. C. Pneumatic Accelerator.* The air cushion "gives." It opens the carburetor as quickly as you *press* the pneumatic bulb—but it cushions every little shock and jar. Thus while your acceleration is quick and powerful, it is always smooth and even.

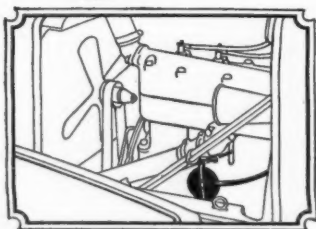
## Other Impressive Advantages

The Pneumatic bulb can be moved wherever it is easiest for your foot to reach, at any time. Anyone can drive the car, and the accelerator can be instantly put just where they want it. It needs no extra foot rest—the bulb itself is a cushion-like rest for the foot. It won't make the foot callous or burn no matter how long you drive. And you can operate it with heel, toe or the ball of the foot.

## Only \$3 and 3 Minutes

Only \$3 buys it—only three minutes installs it. Anyone can put it on the car, without screws or holes in the floorboard. It is extremely simple, but absolutely certain in operation. Every Ford owner approves it and every Ford owner needs it.

**\$3.00**  
*Buys it*

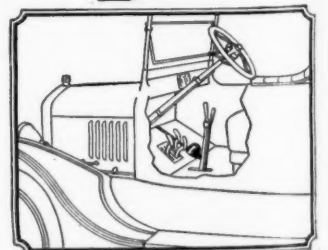


**DEALERS:**—Get the particulars about this new device at once. The discounts are attractive, and the sales are multiplying. Dealers are repeating everywhere. You are in business to make money, and this is a money-maker. It sells, because it does so much to sell itself. Write or wire for samples.

**Motor Products Corporation**  
11805 Mack Avenue, Detroit, Mich.

**M.P.C.**  
**Pneumatic**  
**ACCELERATOR**

**3 Min.**  
*Installs it*





## Fisk Tires as Car Equipment to Produce an Amazing Percentage of Resales

More than 400,000 popular cars sold this year will have Fisk Tires as original equipment.

Last year several hundred thousand cars had Fisk Tires on them when they left the factory.

The tires sent out from a year to eighteen months ago will soon begin to need renewal to

a very considerable extent.

Be sure you are stocked with Fisk Tires to meet the demand.

The satisfaction given by Fisk Tires is shown by the fact that out of 600,000 Fisk straight-side cords, size 31 x 4, less than 50 were returned *for any cause* in the first 18 months of sale.

*There's a Fisk Tire of extra value for every car, truck or speed wagon*



# REO

*The Gold Standard of Values*

## A LINE FOR YEAR 'ROUND SALES

**High Powered Reo "Sixes"**

Brougham—Sedan—Coupe—Phaeton—Touring

THE MIGHTY  
**SPEED WAGON**



IN TWELVE BODY STYLES

REO TAXICAB  
BUS CHASSIS

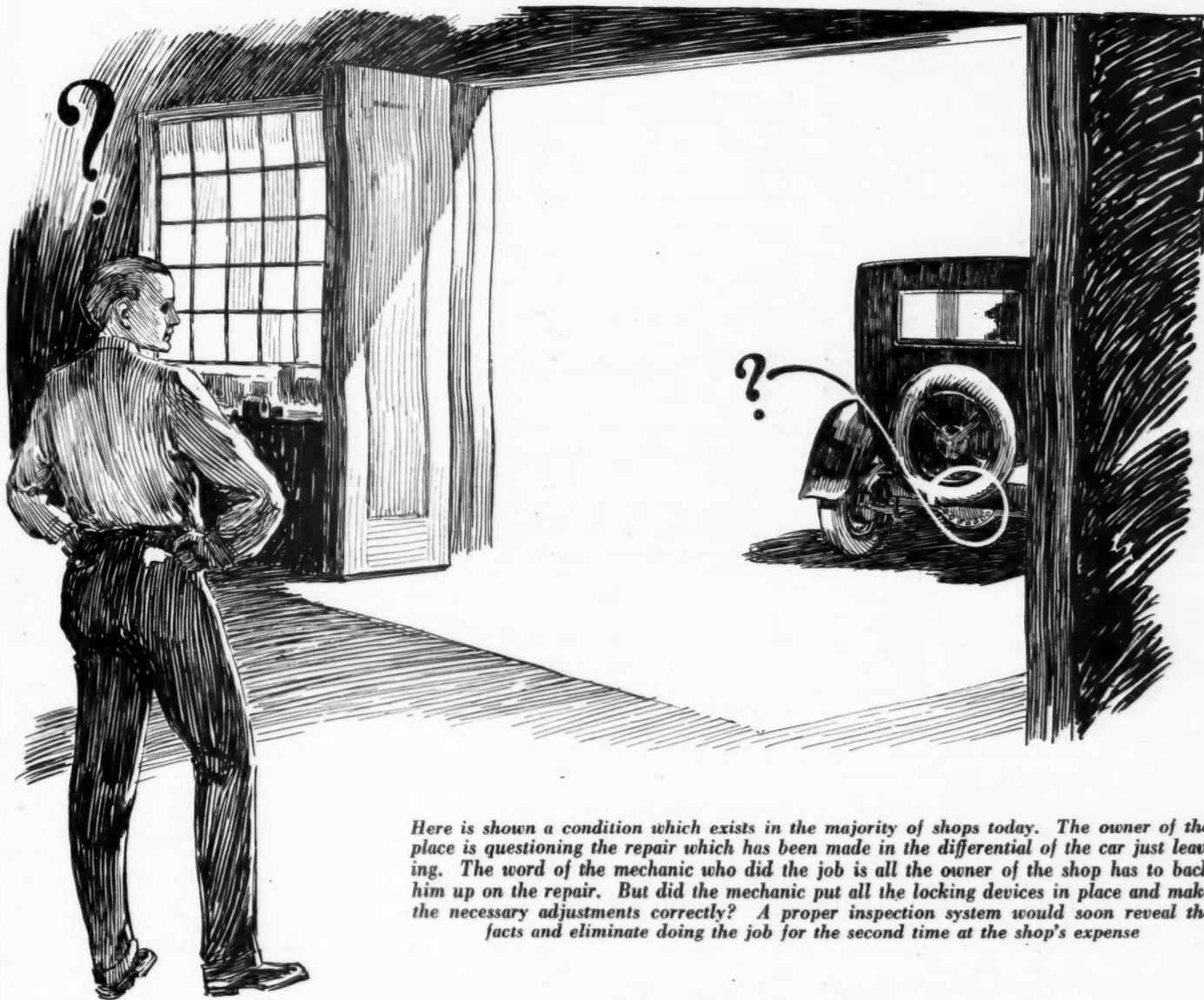
**Most Complete Line in the World—  
All Designed and Manufactured in  
the Big Reo Shops,—Not Assembled!**

*A few territories are still open. Dealer applications will  
receive careful consideration*

---

**REO MOTOR CAR COMPANY**  
Lansing, Michigan

# MOTOR AGE



Here is shown a condition which exists in the majority of shops today. The owner of the place is questioning the repair which has been made in the differential of the car just leaving. The word of the mechanic who did the job is all the owner of the shop has to back him up on the repair. But did the mechanic put all the locking devices in place and make the necessary adjustments correctly? A proper inspection system would soon reveal the facts and eliminate doing the job for the second time at the shop's expense

## Cutting Overhead Through Inspection

*The Greater Percentage of Come-Back Jobs Can Be Avoided by Applying a System That Will Insure a Repair Operation Being Done Right the First Time. Inspection Must Not Stop Simply With Immediate Repair Operation; Condition of Car Just as Important*

By B. M. IKERT

IT often has been said that lost time is the greatest outstanding problem in the automotive shop. This is true of the dealer's shop as well as the shop operated independently of selling motor vehicles.

There is no question but what a great deal of this lost time can be attributed to doing over a job for the second and sometimes a third time.

Some dealers and operators of

shops come to the defense of this condition with the statement that good mechanics are hard to get and as long as you are up against it for good men, what can be done to remedy the ills?



On the other hand there are dealers and shop men who counter with the statement that even though you have inferior men, that is no excuse for a job being put together wrong so long as there is the opportunity for someone qualified to inspect the job before it is "buttoned up." Surely, every shop has at least one man who can pass on a job. The shop is responsible when it allows an inexperienced mechanic to assemble a job incorrectly or perform any operation along the wrong lines.

Just as long as this lack of inspection of repair work exists in automotive shops will the newspaper cartoonists poke fun at the "garages" and the public hurl epithets of "pirates," "robbers" and so on at the men who profess to be "experts" on motor vehicles.

Almost invariably you will find that a successful dealer or a man who operates a successful repair and maintenance shop has taken the necessary steps to insure that every job which leaves his place of business has been done right. At least, he has relieved the mechanic of all responsibilities. Nobody's word is taken for anything.

As long as so many are agreed that it is lost time in the shop that eats up overhead it would seem more thought ought to be given to ascertain where the time is lost. Check up in most instances and you will find it is in doing work for the second time, or to put it another way, in lack of inspection.

Probably some of the greatest offenders are those shops located at summer resorts, where the trade is largely transient. Many of these shops reap a harvest during the summer months because they charge customers excessively and at the same time content themselves with the thought that they will not see these customers again. There is too much of the "let her go at that" attitude in these shops. The customer is fixed up so his car will go perhaps 50 miles or so and then when the old trouble looms up again he will be too far away to come back, so why worry about him?

But some day things will be different for these shops run on such a basis. These tourists will tell fellow tourists to "steer clear" of the Blank Automotive Repair Shop at such and such a town. With motor clubs springing up all around such a state of condition will sooner or later be known by most motorists and this will automatically make the shop change its methods for doing work and charging the customer exorbitant prices, or force it out of business.

Some of the better class concerns selling maintenance have adopted methods for checking repair and maintenance work which can be either bodily adopted by others or approximated.

For instance, one dealer who operates a large maintenance establishment employs a man who represents the customer. This man's chief duty is to pick trouble. He is the official fault finder of the organization and the company feels that if he is satisfied with a job before it is turned over to the customer, the latter also will be satisfied. This representative of the customer is thoroughly



*The tightening of a nut while a simple operation is often a very important one. A tired mechanic or one who is ill may not put quite as much pep behind his work as he ordinarily would. Result, a job goes out improperly set up. But the trained eye and hand of the inspector would catch a loose nut or bolt and prevent shop loss and a dissatisfied customer*

qualified to pass on a car's condition, both before and after the car is taken care of in the shop or service department.

Not only can this man discover quickly anything that is mechanically wrong with a car, but he has an eye for details as to cleanliness and seeing to it that everything about the car is ship-shape for the customer. There must be no evidence that mechanics have been working on the car. The steering wheel must be clean, and carpet in the enclosed car must have no foot prints, nor must the hood have the imprint of some mechanic's greasy hand. In short, this man wants every car to be received by the customers exactly as he would have his own car turned over to him.

There is another idea practiced by a service station handling a relatively high priced car. This shop has given the customers the privilege of picking their own service man. The idea has been taken from other lines of business, as for example when a man seeks to pick out a certain clerk in a hat store to wait upon him, feeling that as long as he knows the clerk the latter will give him a sort of individual service. The clerk gets to know the customer, calls him by name and the customer likes all this. Therefore, this service station feels that the customers' likes and dislikes will be the same in the service station as they are in the hat store.

The mechanics in this case take a sort of personal interest in "their" customers' cars, know the car's characteristics and by thus concentrating their attentions to certain specified cars they naturally are better fitted to do the work necessary than men who work on all makes of cars and for all comers.

**A mechanic who thus works on certain customers' cars will of his own accord seek to put forth his best efforts, because**

he knows that whatever work he may slight will only come back to him. This however, is very seldom the case in this service station because the mechanics are on piece work and are, therefore, careful to do the job right the first time.

Every dealer or operator of a shop dislikes to see a job come back. It always means a loss. Even though the mechanic may be on piece work and has to do the job on his own time, there are still the other items of overhead like light, power, use of tools and parts for which the customer cannot be charged, or at least should not be charged.

And, if a job has to be done over in a shop where the men work on straight time, there is always the 50 to 60 cents an hour the mechanic must get for doing the work over. You cannot refuse to pay him because he will swear up and down that so far as he is concerned he did the work satisfactorily the first time. The customer is equally certain that the car is no better off than it was at first, so there you are. Somebody bungled. And, the chief trouble lies in the fact that no one checked up that mechanic to see that the cap screws or studs were set up tight or that the cotter pin actually was inserted and clinched in the front wheel bearing nut.

We believe most mechanics are honest, but the reflection is always on them when a job comes back. And, it must be remembered that men do not always work alike. A mechanic may be feeling ill and take on a somewhat indifferent attitude when he is setting up main bearings. He will not set them as tightly as they should be, maybe. But the job goes together, the pan is put on the engine and the customer is told his car is ready for him.

In a little while the car comes back, the engine pounds and the customer kicks because he has spent good money for having the work done just a little while ago. The dealer takes it up with the customer and finds that John Smith, the mechanic who did the work, is a good man, but the dealer does not know that John Smith was ill the day those bearings were set up and that the job was turned over to the customer in an unfit condition. John Smith would have done a mighty fine job of it at any other time, but the shop was rushed with business and he assumed some of the "let her go at that" attitude.

Now, had there been an inspector in that shop, it might have been the foreman, service manager or anyone else qualified for the work, things would have gone differently. The inspector would have caught the loose bearings. He would have found out that Smith was indisposed and rather than send the job out wrong, would have put another man on it.

The picture at the head of this article shows a condition that exists all over the country in many shops today. The dealer or owner of the shop, whoever he may be, is wondering about the work which has been done on the differential of the car which is just being driven out of his place of business. The owner has paid his bill and so far as he knows the

job of quieting the gears in the axle has been properly done.

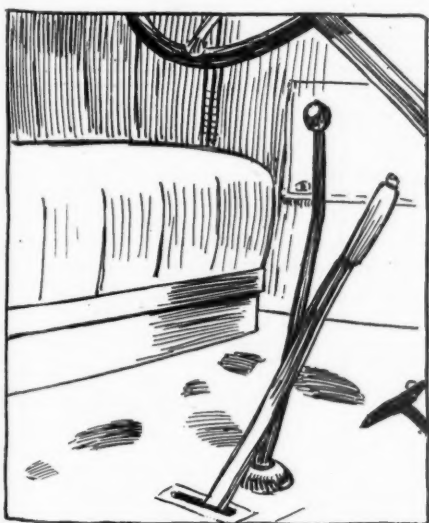
But, does the dealer or shop owner know for a certainty that the mechanic who did the work put all the locking devices on the ring gear and pinion shaft adjustment? Does he or anyone else in the shop know for a certainty that a retaining wire was put on the cap screws which hold the ring gear to its mounting? And does he even know if the right amount and kind of lubricant has been put into the housing? Not a man in the world can tell these things after the housing cover is in place.

If only some of the little details could be watched, how much overhead could be cut. There is a case we recall where just a little inspection would have saved many dollars which the dealer had to pay out for doing over a job.

In this case the engine was dismantled, new parts put in and the engine again installed in the car. The engine had been fitted with new pistons and rings, the cylinders had been reground and bearings taken up. Apparently everything had been done all right but the customer called up an hour or so after he had driven the job away and stated he was stuck. The service car went out and the engine of the customer's car could not be budged.

The trouble was caused by failure of the oiling system because a brass lock nut on the oil pump had not been tightened. The pump was sucking air instead of oil, but the owner did not know it. He drove the car until the engine seized. A check on the oiling system would have prevented all this. No one thought of looking at the oil gage to ascertain if the system was functioning.

The value of any piece of material or the relative value of several pieces of material can only be ascertained by inspection. The dictionary has this to say about the word inspection:



Carry your inspection system to the obvious things about a car. The best repair operation in the world is offset by a greasy footprint on the carpet of a coupe. There may be some excuse for getting dirt on a customer's car, but there is none for leaving it there

**"To look upon; to view closely and critically especially to ascertain quality, or state, to detect errors, etc."**

Now the particular part of this definition which is of special value to the automotive dealer or maintenance man is that referring to looking closely and critically to ascertain quality and errors. **Only by detecting these qualities and errors can the business be built up through the process of reduced overhead.**

Imagine what would happen if our business concerns today never had an auditor come in to check over the books. No concern of any consequence today would think of operating its business without having an accountant go over the books regularly. It is the latter's job to check up the work the other fellow has done. He is the one to discover the errors and also the one who ascertains the quality of the account.

Practically every factory, not only the motor vehicle manufacturers, employs one or more inspectors to check its product in the various stages of fabrication. A large factory may have inspectors that run into the hundreds.

The inspectors are necessary to see that the product runs uniform, that the quality does not vary and that errors do not creep in. If they should creep in there is usually ample time to ward off a loss because the finished product will not as yet have gotten into the hands of the consumer.

Now, the same general scheme of things used in the factories can be used in a modified form by the automotive repair and maintenance shops. It logically follows that there should be a rigid system of inspection in the automotive shop when we consider what the factories do.

Why, for instance, should the metallurgist in the factories go to all the trouble to give us the best of steels and why should the factories maintain rigid inspection departments to see that the product goes out right, only to have the product fall on the road because some mechanic who was not checked up failed to put a cotter pin on the connecting rod cap bolts and the rod let go punching a hole in the crankcase?

The large service station naturally can afford a larger staff of mechanics ranging from the greasehound to the master mechanic. In this case the master mechanic or his assistant should be the one to check over the work. Their experienced eye and hands will detect errors and poor work quickly.

The small shop cannot do things on the same scale as the large shop, but even in the small shop there must be some way of checking up the work.

We asked one dealer in a small town what assurance he had that the work his men did was done correctly, when he himself was gone from the shop quite a bit and trusted all this work solely to the men. His reply was that these men had been with him for a long time; that he had given them a little interest in the business and not only that but that they took a certain pride in doing their work well.



*Had this man inspected himself in a mirror he would not have gone to the party as he was. The gob of soot completely spoils his otherwise fine makeup, just like the grease or dirt on the inside of the customer's car spoils the otherwise good repair job*

Sometimes it is the fault of the dealer or owner of the shop that work is not done right. Many of these are not as yet sold on the fact that good equipment will cut overhead. Mechanics who have not adequate equipment cannot be expected to put forth their best efforts. I talked with a mechanic in a shop the other day on this point and he said, "The only thing they are interested in this shop is getting out the work."

This same mechanic also said that the foreman had told him not to be too fussy with any job. Certainly such instructions coming from the head of the shop could not help but upset the morale of the shop with the result that only mediocre work was turned out.

In the smaller town shops it is a pretty difficult thing to keep customers out of the shop. The result is that a mechanic very often has to leave the job he is on to attend to some other customer's wants. A mechanic who thus is interrupted many times a day is apt to forget certain things and quite often a job is delivered to the customer in an unfinished—uninspected—condition.

The opportunity was given to me the other day to observe this very point. A mechanic was working under a car when a customer came in with his car. This particular customer asked for the man under the car, in fact he called him thus "Mike, got a couple of minutes to look at my car?"

Mike slowly pulled himself from under the car and went over to the new arrival. After taking care of his wants Mike went back to the other car. He knelt to look under the car, then said partly to himself and partly to another mechanic, "Guess, I'll let her go at that."

From Mike's previous actions under the car it was evident he was not thorough with the job, but thought he was safe in taking a chance on the job being tightened enough.



Inspection does not stop with checking over only the actual work which has been done by the mechanic. Very often he has undone some things which, if not caught in time, will react unfavorably to the establishment.

For example, a mechanic may borrow the starting crank belonging to the car on which he is working and forget to put it back under the front seat. There may come a time when the owner of the car needs the crank and if it is not there, well, you know what happens.

Many shops guard against anything like this happening by checking the contents of the car in the presence of the owner. They make an inventory of the stuff left in the car and have the card signed by the owner. Then when the car is returned to him the stuff must tally with the card.

Remember also that inspection takes in such things as looking over the interior of the car to see that there are no dirt or grease marks. A foot print on the carpet of a coupe is one of the surest ways in the world of making a car owner angry, especially if the latter happens to be a woman. All the fine work done on the engine by the shop will not make up for the foot print, in her mind, because she knows it was not there when the car was brought in. It's like the man all dressed up in evening clothes who has a gob of soot on his collar. The soot spoils his whole makeup though he may have the most expensive garb he could buy.

An analysis of the come-back jobs—the ones that shoot up the overhead—in the majority of cases shows that they could have been prevented by a little

time spent looking over the job before it went out. We recall where a brand new car was delivered to an owner under the assumption that the factory had taken care to see that the chassis was lubricated all over. It so happened that this car came back after some 800 miles with the rear axle "shot." There had been little or no lubricant placed in the differential housing. What would have prevented this trouble? The dealer's inspection system. A factory slips up once in awhile, but the alert dealer will not let such a job get into the hands of his customer.

New car inspection in fact, is fully as important, probably more so, than repair operation inspection, because certainly you want to sell a customer right the first time to get his continued patronage.

## Electricians on the Job

They Know "What's Wrong When There Is Too Much Spark"

WE have some up-to-the-minute electricians among our subscribers and when we feel like taking a vacation may pass along to them some of the letters with questions hard to answer.

The problem on page 47 of the March 15th issue showed us that the question was not as much of a puzzle as we thought. Even the phony generator circuits, which did not have anything to do with the question asked, did not throw many of our readers off the track.

George Kamps of the Zeeland Electric Service Station of Zeeland, Michigan, wrote, "The trouble with this outfit is that the coil taken from the Saxon Roadster is a coil for the open circuit system, while the outfit taken from the Maxwell is a closed circuit type." Perfectly right, George.

S. P. Beaman of the Autelectric Service Co. of Kenton, Ohio, also hit the nail on the head. He said, "The Atwater-Kent coil used is of the open circuit type. This coil is wound with a very heavy primary for complete saturation in a short time interval. This type of coil would draw an excessive current when used with the Atwater-Kent Igniter for the Maxwell car. By inserting an ammeter in series with the coil a reading in excess of 5 amperes would indicate that the primary had a very coarse winding and that the coil should not be used with this type igniter."

R. J. Robertson of the Automotive Electric Works of Daytona, Florida, had the right idea and said among other things, "The type K or box type coil is wound for open circuit breaker and is not suitable for any igniter except the H or K 2 type and no amount of condenser will overcome the extreme sparking."

F. B. Winter of Clear Water, Florida, not only corrected for coil trouble but also changed the generator circuit to make it more nearly right, while A. B. Rasmussen of Walnut, Iowa, said that the coil was unsuitable and also called at-

tention to the fact that the ground wire had been left off. He is right on that point, as well as the main one, and the omission of the ground wire means that somewhere inside of the coil the spark has had to jump through the insulation between the windings in order to complete the secondary circuit.

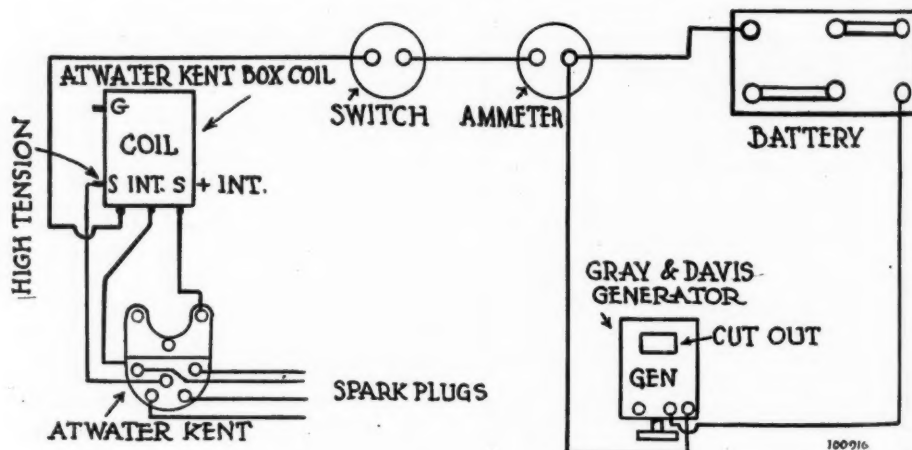
We also have the correct solution in letters from Arthur King of Ruthven, Iowa; W. W. Bolwar of Floris, Iowa; Louis Hess of Chicago and E. N. Howe of Palestine, Texas. Also the correct answer on an unsigned postal card. Perhaps this man wasn't quite sure of himself and thought he better not sign it.

Three or four letters received indicated

that the writers were thrown off the track by the incorrect connections of the generator. Others were about right in asking how there could be a return circuit as the grounds necessary are not shown. However, there must have been a circuit or there would not only have been no flashing at the interrupter points but worse than that, no current at all. We can therefore assume that there must have been grounds to account for the primary circuit, even if the diagram does not say so.

For the benefit of those who are interested but did not see the problem when originally published, it is here reproduced.

WHAT'S WRONG WHEN THERE IS TOO MUCH SPARK?



Q—We installed an Atwater-Kent ignition system taken from a Maxwell car on another car, using a six-volt battery. We took off the original Atwater-Kent coil and used a six-volt Atwater-Kent coil box which had formerly been used on a Saxon four-cylinder roadster. We are sending you a diagram for inspection. It will throw a spark 1½ inches long off the high tension post to ground, but it burns the points on the breaker arm very badly. We have been wondering whether

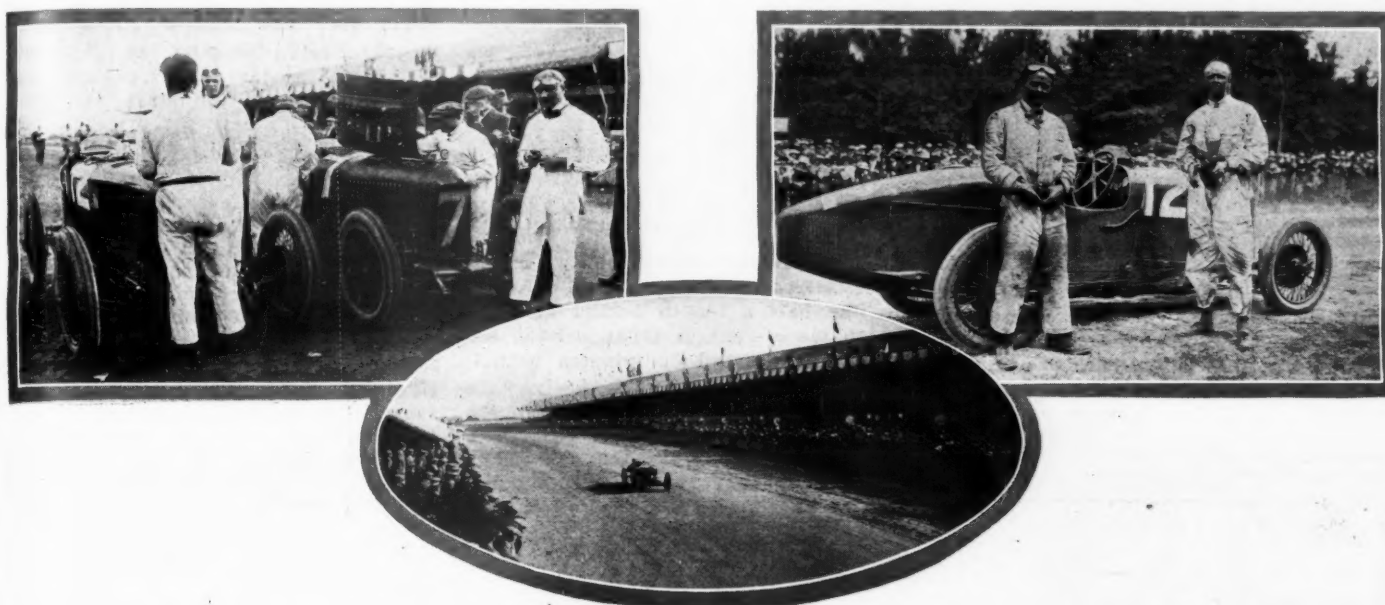
to connect a condenser on, in order to stop the burning of the contacts. If this is necessary, please send a diagram. The car runs fine until the points get burnt and then it will not start.—An Illinois Mechanic.

We are going to leave it up to the readers of MOTOR AGE to determine what is wrong with the ignition system. The diagram is shown just as it was sent to us.



## Sunbeam Wins French Grand Prix at 75.4 m. p. h.

*Fiat Team Has Fastest Cars, But Poor Track Causes Failure. Superchargers on Fiats Appear Complete Success. Winner Uses Straight Gasoline*



Some things the camera man caught at the French Grand Prix. The Sunbeams which took first and second are shown side by side. Another view shows Seagrave beside his car. The car on the grand stand stretch is Bordino's Fiat which threatened to cop the prize, until a flying stone put the supercharger out of commission

THIS year's French Grand Prix recently run over a 14-mile triangular course at Tours, was won by an English Sunbeam, driven by Seagrave. He averaged 75.4 m.p.h. and drove the 496.5 miles in 6:35:19 3/5. Divo, in a Sunbeam, was second; Friedrich in a Bugatti, third; Guinness, Sunbeam, fourth, and Lefebvre, in a Voisin, fifth. Seventeen cars started, but only the five mentioned finished the race which was run over a course none too good.

Although a failure for Fiat so far as the final result was concerned, the race proved that these cars were the fastest of the bunch. Giaccone's Fiat went out with a broken valve, but the two others were victims of the state of the road.

The Fiat supercharger, used for the first time this year, appeared to be a complete success. The blower is contained in an aluminum housing at the front of the engine, with the radiator mounted on it, and is driven direct off the crankshaft, thus always being in operation. The compressed air is carried to the carburetor through a passage way cast in the basechamber, with an automatic valve on the line to relieve excess pressure. A line is taken from the main air passage to a double pump on the instrument board and driven by flexible cable from the exhaust camshaft, to maintain a constant pressure on the carburetor.

This is the first time a supercharger has been used in a really important race in Europe, and the only other firm employing a device of this nature is Mercedes. While the Fiat engineers decline to make any statement, it is believed that their device adds 20 per cent to the power of the engine. The maximum power is believed to be not less than 120, at probably about 5400 revolutions. The cars will do 125 m.p.h. it is said.

Sunbeam, the winner, and the only firm to finish with a full team, met with conspicuous success with the new six cylinder racing engines, designed by Vincent Bertarione, until last year a member of the Fiat experimental department. Bertarione made only a few changes on last year's Fiat design. Instead of vertical shaft drive for the camshafts he employed spur pinions, and he had counterweights in place of circular webs for the eight bearing crankshaft. Roller bearings for crankshaft, rods and camshaft, mounted direct on the shafts without cages, of the same type as the Fiats, were used. A single Solex carburetor fed the six cylinders. The Sunbeam engineers claim that 108 h.p. were obtained from the engines, whereas the highest ever claimed by Fiat last year was 95 h.p.

Begun very late and starting in the race without having been round the

course in practice, there was some doubt about the ability of the 12 cylinder, 122 inch Delage. During the seven laps it was running it gave a very good impression and appears to be a complete success.

The Voisins, with Knight type sleeve valve motors, were never sensational from a speed standpoint. On the bench tests these engines had never given more than 80 h.p., which placed them at a serious disadvantage with the others, with maximum power varying from 95 to 120. They used magnesium piston with detachable cast iron skirts.

Despite high engine speed and compression ratios of 7 to 1, there was an absence of magneto and plug trouble. Fiat, Sunbeam and Bugatti used the Bosch magneto. In the case of Fiat the magneto was a new type, hand made, and not yet in full production, with double make and break. It is claimed that this magneto has been run successfully at 9,000 revolutions, each make and break of course operating at half this speed. There was no battery ignition on this year's cars. Delage, Rolland-Pilain and Voisin had Scintilla magneto. K. L. G. plugs were used by all but the Bugattis.

Straight gasoline was used on the winning Sunbeam; Fiat employed a mixture of gasoline and Benzol, and Rolland-

Pilain ran on gasoline only. There was no use of alcohol mixtures.

The Fiats will race next September on the Monza track where they will have to meet the three Miller cars driven by Jimmy Murphy, Alzaga and Zborowski. Sunbeam is a doubtful starter in this

race, but Bugatti, Mercedes and Benz appear certain contestants.

The winning cars used Michelin cord clincher bead tires, with six duraluminum safety lugs. It is claimed that these cannot be pulled off the rim if run deflated, and that they are lighter than

straight side rims. The winner went right through without a tire change, and on the whole, the number of stops for tires was very slight. To get the weight down, Bugatti used 28 by 4 in. wheels fitted with Dunlop straight side cord tires.

## Fuel Consumption Race Shows Small Car Economy

With a gasoline allowance requiring a minimum mileage of 39.3 miles to the American gallon, a 2-seater Mathis car, driven by Lams, won its class in the French Grand Prix fuel consumption race at Tours, with an average speed of 50 miles an hour for a distance of 185 miles. Bocchi, on a similar car, came in second, followed by Desvaux on a Salmson, Louis Rigal on Aries, and Gabriel on Aries.

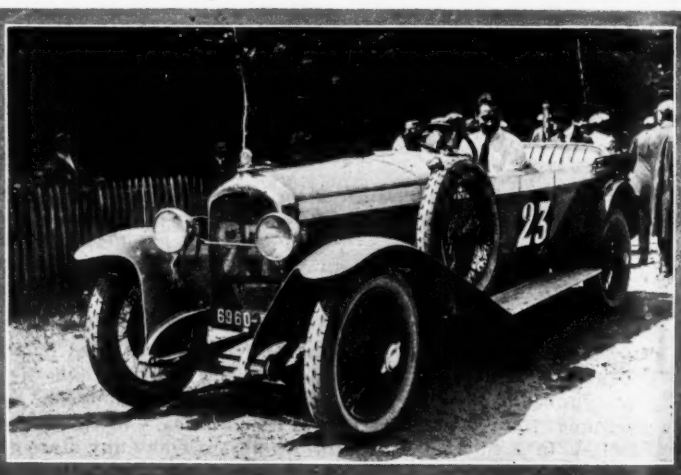
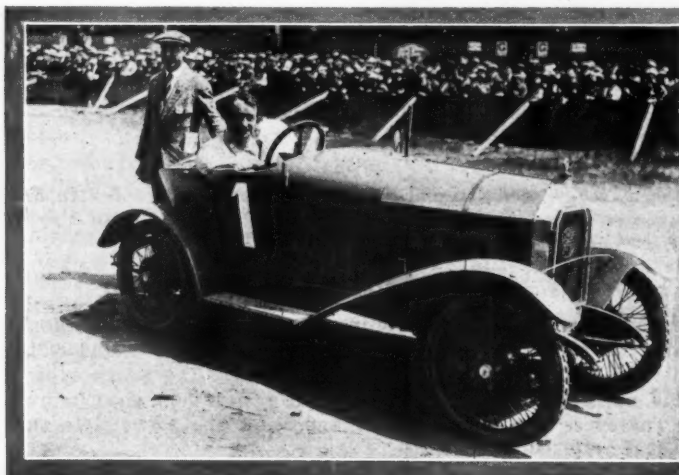
In the four-seater car class, where the allowance of gasoline was equivalent to 23.63 miles to the American gallon, Cabailot on a sleeve valve Peugeot was

the winner at an average speed of 42.4 miles for a distance of 241 miles. Two other Peugeots, driven by Buteau and Bouverot, cut the line at practically the same time as the winner.

In the five-passenger car class, called upon to average 15.7 miles to the gallon, Andre Boillot finished first at an average of 51½ miles an hour for a distance of 310 miles. Boillot brought his two teammates, Alfred and Eugene Morillon, over the line half a length behind his car. Fourth place went to Floht, driving an Aries, who finished 32 minutes behind the winner.

The fuel consumption race attracted comparatively little attention. With normal bodies having clearly defined minimum dimensions, the start was given from cold with only the driver aboard, but with ballast equivalent to one, three or four passengers, according to the classes.

Because of the limited amount of gas, all the competitors ran at about 70 per cent of the maximum power. While the average speed for the little cars was high, it was so obvious that the competitors were running at less than their maximum that the race was robbed of all spectacular features.



The small car is the two-seater Mathis which went 39.3 miles on a gallon at an average speed of 50 m.p.h. The other car is the Peugeot driven by Andre Boillot which won in the five-passenger class doing 15.7 miles to a gallon at an average of 51.5 m.p.h.

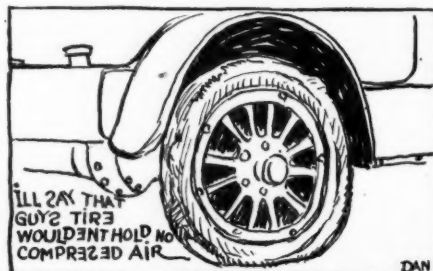
**JULY 26**—Onist, i don't see how some guys keep going on the tires they have on their car. Today there was a bird stopt for gas with a pair of tires that would make a junk man's stock feel all stuck up.

Me thinking here is my chance to scare this nut into buying 1 or 2 tires, i waltzes out and says, Them tires of yourn has seen a lot of mileage. Sure have says he about 12,000 miles and still going strong.

Theres a stretch of awful bad road down here a wase don't you think you auto have a spare so's if one of them goes out on you you wont have to walk? I was just getting ready to quote him prices on a special that we had wen he sais Lord bless you no sunny them tires is good for 5,000 miles more maybe, they ain't got none of this compressed air in them that runs out as fast as you put it

## DAN'S DIARY

in. I got a secret compound in them tires wich is going to revolushionize the tire business as soon as I get it perfected. Me saying good nite here is another inventur. After a few minutes he says, Say wot do you suppose makes



that ex give away like that I had it welded just a little spell back and now its getting bad already. Me thinking Heck what is tires for, to see how long they will run or to make the car ride easier and keep it from shaking to pieces. I wanted to tell this nut why didn't he fill his tires with sand or make them out of iron and not bother with the rubber but aw shuks wots the use.

## MACON (GA.) DEALERS REORGANIZE

MACON, Ga., July 24—The Macon Automobile Dealers' Association, at a meeting here this month, was entirely reorganized, and plans were made to hereafter hold regular meetings and to cooperate with the Atlanta and state associations in matters of importance to the automotive industry in Georgia. D. E. Adams is president of the reorganized association.



# Studebaker Announces 1924 Models

*Body Refinement Together With Three Standardized Chassis Are the Outstanding Sales and Maintenance Features for the Coming Year*

**T**HE Big Six, the Special Six and the Light Six will continue to be featured by the Studebaker Corporation for the coming year, their popularity no doubt augmented by the 12 body types available.

## The Big Six Line

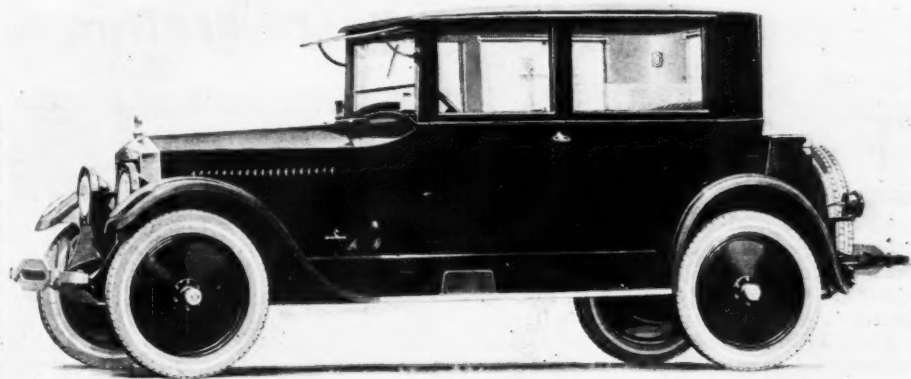
The Big Six line comprises four models mounted on the standard 126 inch chassis with 60 hp.,  $3\frac{3}{8}$  inch by 5 inch motor. They are the 7 passenger touring car, the 5 passenger speedster, the 5 passenger coupe and 7 passenger sedan. A slight reduction in the camber of the springs is effectual in producing a lower and more pleasing appearance of the car.

Mechanically the Big Six is but slightly different from the Big Six of last year, a few changes having been made for the purpose of eliminating vibration at high speed. As previously the 1924 model Big Six will carry disc wheels and front and rear bumpers, together with an extra wheel, complete with Cord tires and tire carrier. On the speedster and sedan two spare wheels are provided.

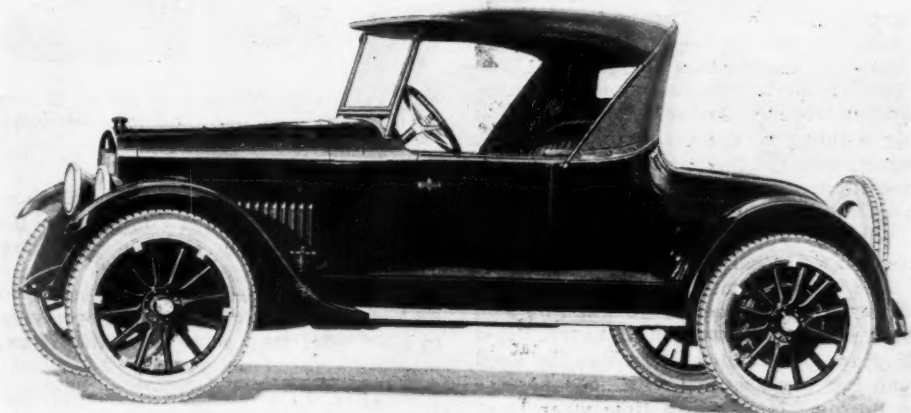
The sedan, coupe and speedster are equipped with a large roomy trunk while the closed cars have among many other features, a heater, flower vase, and interior reading light while the sedan is also furnished with a silver finished vanity case and smoking set.

## The Special Six Model

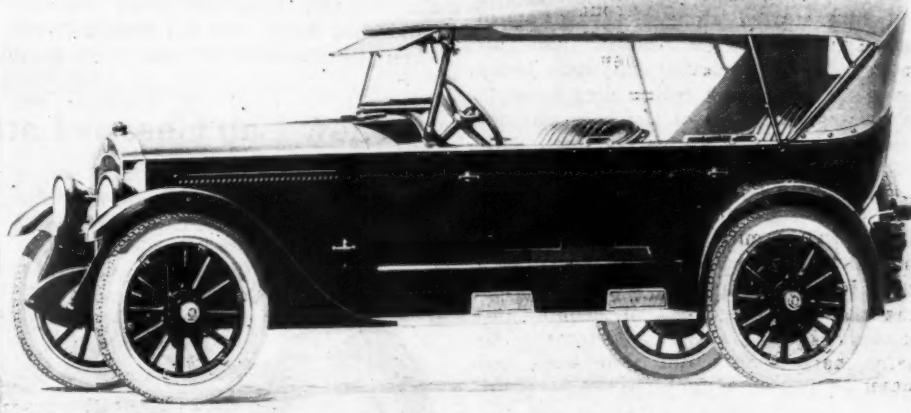
The Special Six line comprises four models, mounted on the standard 119 inch chassis with 50 hp.,  $3\frac{1}{2}$ x5 inch motor. They are the two passenger roadster, five passenger touring car, five passenger coupe and five passenger sedan. Here a slight flattening of the springs together with a lowering of the top and minor changes in radiator, hood, cowl and body shape have given the Special Six a very



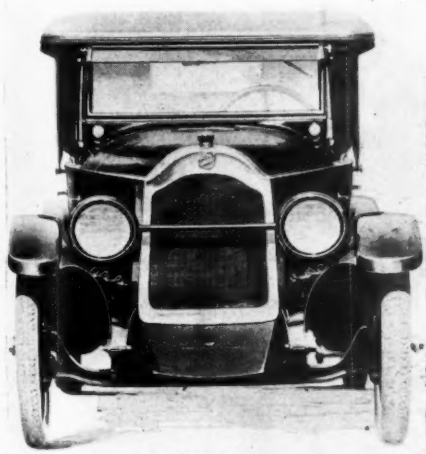
*The trunk is regular equipment on the Studebaker Big-Six 5-passenger coupe*



*The 1924 Studebaker Light-Six 3-passenger Roadster*



*The Studebaker Special-Six 1924 phaeton*



*New radiator and hood lines are seen in a front view of the Studebaker Special-Six*

fine appearance. The general equipment of the Special Six is practically the same as on the Big Six.

## The Light Six

The Light Six line comprises four models mounted on the standard 112 chassis with 40 hp.,  $3\frac{1}{8}$ x4 $\frac{1}{2}$  inch motor. They are the 3 passenger roadster, 5

passenger touring car, 2 passenger coupe roadster, 5 passenger sedan and in addition a custom built car is available the chief feature being a Brewster green finish, khaki top and special complete equipment. The detail body equipment of the Light Six is quite similar to that of the other models.



## Automotive Merchant and Bank President

*Twenty-five Years of Successful Effort in the Automotive Field Have Made "C. E." Fay Not Only a Big Man But a Popular Man in the New England Territory*

**T**HE board will now come to order; gentlemen, we have requests for loans totaling \$75,000 so let us examine them."

That is typical of scenes which occur from time to time in the office of the Watertown Cooperative Bank, of Massachusetts, one of the first six in the Bay State. It also was typical of similar incidents in the Back Bay National Bank before that institution was merged with a big trust company.

The man who called the meetings to order was President Charles E. Fay. But directing two big banks was but a minor part of his work. The major job was managing the affairs of the C. E. Fay Company, distributors for Maxwell and Chalmers cars. Passing along Commonwealth Avenue, Boston, motorists see a big building at the corner of St. Mary's street, with the Fay sign on it. Ask anyone along the row regarding the business and they will remark:

"Charlie Fay is making money with his Maxwell-Chalmers."

And that is nothing new. He made money from the early days when he sold tires in a little store on Hanover street 25 years ago. Later on he was the Ford man for New England with headquarters in Boston. It was at a time when Ford built fours and sixes. Fay sold them, a whole lot of them. He had faith in Ford and he was one of the original subscribers to the stock of the Ford Motor Company of Canada. Business sagacity got him started along the pathway of investments in real estate, and his money began to double up until today he has a good bank roll, a nice home in Watertown and one of the best summer residences on the exclusive North Scituate Beach.

Just how did he get ahead? By having both feet on earth all the time. Those who know "C. E." as he is familiarly called, cannot name a time or place when he ever exploded. His even temper has placated thousands of people, and caused irate, irascible customers to listen to reason. But that does not mean he is not a fighter. Let someone try to put something over on him and things begin to happen.

He has succeeded because he has been on the job about all the time; that is until within a couple of years when he decided to take some trips that he felt he had earned the right to. Now leaving his son Allen Fay in charge, with full authority, he has no worries while away.

His principal asset has been an organization trained to work together. Next he is always around to meet customers. There is no inner sanctum lost



Charles E. Fay, President of the C. E. Fay company, Maxwell and Chalmers distributor at Boston

in a maze of other offices. And he is a splendid judge of sales conditions. He seems to have an instinct regarding sales that is akin to a seaman's instinct about weather. Never afraid to stock up he keeps his dealers contented by trying to have what they want when they want it.

Building up a clientele of friends was an easy matter for him. From the old days when the word would be passed "Charlie Fay is the man for that" to the present he is chosen for all sorts of tasks. As one of the originators of The Chronograph Club he timed the first Vanderbilt races with his Boston friends when the sponsors of that event could

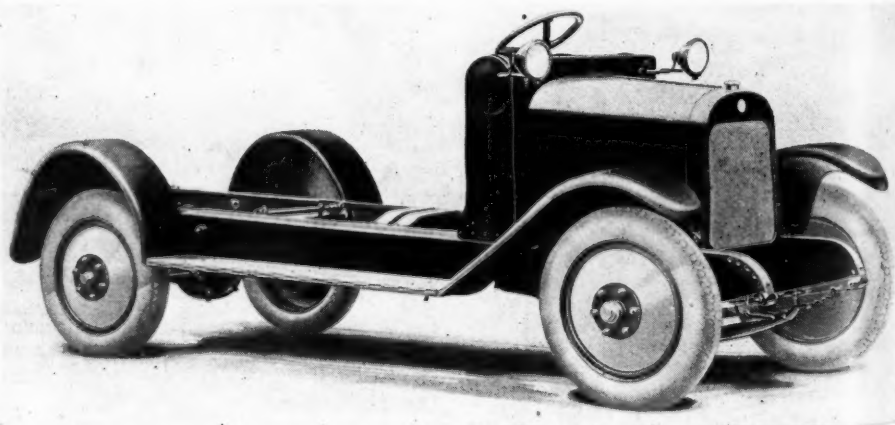
get no one else upon whom they could depend. Likewise it was with the famous "Climb to the Clouds" up Mt. Washington.

Doing things of every sort because he felt they should be done right was bred in his nature. Therefore, when some of his motor friends interested in the banking business in Watertown, sought a man who could give their big co-operative bank more standing and who could build it up they picked out Fay. He has been president for a number of years.

Later on other motor friends identified with the Back Bay National Bank did not like the way things were going. They held a meeting, changed the officers, and put Fay on the job as president. There he did a good job and cleaned up old accounts, got the bank in fine standing, and when one of the biggest trust companies of Boston looked about for a location in the motor district they investigated the Back Bay bank, and bought it.

Naturally Fay has been active in motor affairs, and for years he has been a director of the Boston Automobile Dealers Association, and has served as its vice president. He is one of the first men called upon when something important is pending. Today he is never too busy to chat with his old friends who drop in. Wholesouled, of unquestioned integrity, if the truth were known it would reveal many acts of kindness to men in the trade who were slipping. That is why today everyone is glad of Fay's success and there are none who look upon him with envy.

### Yellow Cab Chassis Latest Entry Into Truck Field



The Yellow Cab Mfg. Co. has entered the truck field with the announcement of the Yellow Cab Express chassis. The various units are built to specifications by such concerns as Continental, Timken, Brown-Lipe, A. C. Smith and others. It is a 1 1/4 ton job with a four speed gearbox, disk wheels, and will sell for \$1740 f.o.b. Chicago

## Bill Fixit's Return

*Hutch Cranks Betty Half a Mile Up Stream and Bill Gives a Lesson in Magnetism*

By A. H. PACKER

Previous articles in this series were published February 15, March 8, May 3, May 31 and July 5, 1923.

*It's in Shakespeare's tales,  
Or perhaps Mark Twain,  
Deys a story tole  
'Bout a awful rain.*

*An' a house on a rock  
An' anudder on de san'  
An' de one stay put  
But de udder couldn't stan'.*

*An' de boy dat piled de rocks  
Must o' used cements  
But de udder foolish feller  
Didn't hab no sense*

*An' de boy dot fix de motor  
Gotter know wat he's about  
Or he'll wreck de bloomin' business  
An' he neber fin' out*

*Dat some hours and minutes spent  
Wid de magnets an' de juice  
Might a tightened up de knections  
Where his brains am loose.*



BETTY JETLINE had been standing on her dignity, at least as far as Charlemagne Hutchinson was concerned, for Hutch had taken Dorris Leding to the Junior Prom just because the old man had bought Dorris a new Runwell car. It was a mean trick Betty had concluded, not knowing that to Hutch it was just part of his job, and she figured she would show Hutch where to get off. The showing had been complete and satisfactory, but far from comforting, and now the dignity was becoming more and more uncomfortable as a place to stand. Beginning to repent, she argued with herself that Hutch was not a bad sort, and should he ever ask her to go some place soon, she would do so, just to avoid hurting his feelings. Betty was quite sympathetic—at times.

It was accordingly with an inward thrill, poorly concealed, that Betty received a note from Hutch asking her to go up the river on the following Sunday. It was then Wednesday, and Betty could hardly wait. Hutch explained, for want of better alibi, that, as Bill was about to handle motor boats, he thought he had better become acquainted with their mechanism.

Betty carried the lunch, while Hutch had his hands full with a can of gasoline, a large monkey-wrench and some small tools. If the engine gave trouble he certainly had the makings of a repair job, if tools alone would qualify.

When they came to the river bank, they found the old boat half sunk and it took half an hour to bale the water out with



"Better leave that old bunch of worthless iron for Bill or Red to worry over," said Betty. "You take one oar and I'll take the other"

a used tomato can. Then another half-hour passed as Hutch wrestled with the portable motor, the oversize wrench and the massive oak board that posed as the back of the boat's rear seat.

The massive wrench and the uncanny persistence whic' Hutch displayed eventually won, and with Betty stowed away in an army blanket and some pillows, Hutch innocently cast off, and proceeded to crank the engine. Strange to say it was easy to crank, apparently enjoyed the attention it was receiving on this fine summer morning, but definitely and absolutely refused to perform in its own behalf. True, it did at one time give a faint cough, as though a grape fruit seed had gone down its windpipe, but satisfied with this one weak attempt it subsided into peaceful inaction.

A salesman Hutch may have been, but on this occasion he was unable to sell the stubborn motor on the idea of firing, and after cranking until the lazy propeller had kicked the boat half a mile up stream, Hutch gave up in disgust. Unintentionally he had laid a hond on a none too good wire, while with the other hand he had jerked the flywheel. The shock he received assured him that the spark must be good, at least for an engine, and as there was gasoline in the tank, he was stuck.

"Better leave that old hunk of worthless iron for Bill or Red to worry over," said Betty. "You take one oar and I'll

take the other, and we'll have some fun that way." And up she jumped undiscouraged by the perversity of inanimate machinery.

The shop conference was about to start. Hutch had brought the junk in to have its distemper analyzed. Some of the shop gang were already there as Bill clamped the outfit in a vise, and gave the flywheel a whirl. Nothing happened. Bill pulled the wire from the spark plug and held it within a quarter-inch of the engine and gave the wheel another whirl. Again nothing happened. He held it closer, and still closer, until when the air gap between the terminal and engine was about 1/64-inch a faint spark was seen to jump.

"There's your trouble," said Bill. "The flywheel magneto is shot some way or other, magnet probably weak, but it's hard to tell when the compression is as good as it is on this engine. Got this bunch of junk from old Sam Dobson, didn't you, Hutch? I remember this engine now. Some way or other he managed to break a crank shaft, and I ordered a new one for him. Then when it came he kicked on the price and wouldn't let us put it in for him.

"Did the job himself; took the magnet out of the magneto and had it knocking around his barn, without a keeper on it, until there wasn't much strength left in it, then lost the key and put it on, depending on the nut to hold it. From the way he used his stillson on this nut



I guess he made it hold all right, but he evidently got it out of time without the key, and combined with the weak magnet he never was able to run the engine again unless he used a battery. Even then he had lots of trouble.

"I remember he would hardly speak to me after that. Probably figured it was the fault of the crankshaft I got for him. Well, you can't do much with folks like that."

While Bill was talking, Hutch was shifting from one foot to the other, trying to get a word in edgewise, but failing to find an opening.

When at last Bill had finished his account of the ancient engine and the manner by which it had come to this humiliating condition, Hutch spoke up: "What you say may all be true, but you'll have to show me that there's anything wrong with that spark. I got hold of that spark plug wire where the insulation's off when I was trying to crank it and I sure got some shock," said Hutch. "Don't see how there could be anything wrong."

"Was the boat a bit wet?" said Bill.

"Sure was," said Hutch. "Half full when we—I got there. Had to bail it out with an old tin can."

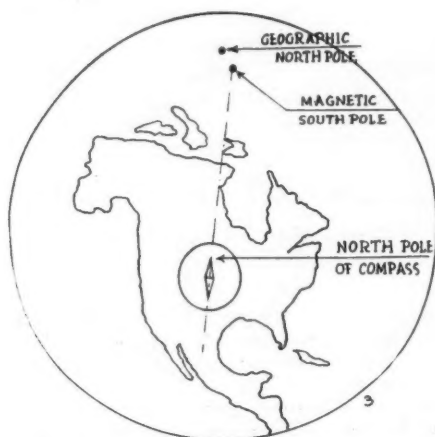


Fig. 3

The earth's magnetic action affects the compass

"Nuff said; you can stop right there; you could take the dearest mag or coil I ever saw, make a nice wet connection to your feet, get hold of the business end of the system, and shock yourself three feet in the air. That's no test at all as to whether the outfit will give a spark for ignition, so I still reserve a place for my original explanation."

"All right," said Hutch. "Guess I better back up and join Valvy over here. He sort of got in dutch at our last session, now I am going to apply for membership in his fraternity."

Valvy grinned. He remembered the mistakes he had made at the last meeting, but he didn't figure that would stop him from asking more questions. "Just how can we learn to tell about an engine that way and know that the trouble's with the spark," he wanted to know. "Can you give us some rules for it?"

Bill congratulated himself on picking the Valve Grinding Fiend. He was green and poorly educated, but showed the right

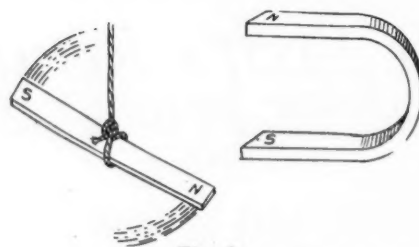


Fig. 1

Unlike magnetic poles attract each other

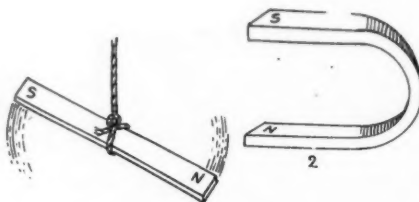


Fig. 2

Like magnetic poles repel each other

spirit, and Bill rated this qualification above many others.

"It's a long story," said Bill. "And there are few that are willing to listen to the first part. They say it is dry and uninteresting. Then they skip along and try to read the last chapter and find it too deep. That's why there are so few mechanics that know anything about electrical trouble shooting. It isn't because it's hard, but because they won't spend the time on the foundation principles. However, if you boys will stand by, we will make a start with a few magnetic principles, for there isn't an electrical machine of any consequence that does not use magnetism."

"Magnetism is the basis of the starter, the generator, the ignition coil action, the telegraph and telephone instruments, the massive machines in the power houses, the motors that drive the ocean liners and the action of radio sets. Even when there is no magnet visible, the magnetic effect of electrical currents is more or less perceptible in the vicinity of those currents."

"Gee," said Valvy, "It must be great stuff."

Bill continued: "This most common magnetic device that we know about is the compass, which is merely a small piece of magnetized steel mounted in a case, where it will be protected, and at the same time it is always pivoted so as to be free to turn. We all know that a compass points north, at least one end of the needle does, while it is equally true that the other end points south."

"When this action was first discovered, they said that the end that pointed toward the north part of the earth was a north pole, and that's what it has been called ever since. This action of the compass shows that magnetism has a power of attraction, and if we suspend a bar magnet with a cord as shown in Fig. 1 and then bring a horseshoe magnet near it we can find out what the effect will be. In Fig. 1 we will find that the N pole of the bar will be attracted by the S pole of the horseshoe magnet. Then if we turn the horseshoe magnet

over as shown in Fig. 2, we will find that the bar magnet turns around, for there is an apparent repulsion between the two north poles.

"This brings us to an apparent contradiction when we figure that unlike poles attract each other while like poles repel, for the ordinary magnetic compass has its north pole point north. In Fig. 3 we have an illustration of this action and the only conclusion we can draw is that when the point of the compass was labeled that way the laws of magnetism were not understood. Now that all our calculations are based on calling a certain end of the compass north we have to make the rest of our theory fit."

"The easiest way to do this is shown in Fig. 3, where we assume that near the north geographic pole of our earth there is a south magnetic pole. In this way we can account for the north pole of the compass pointing as it does, and we can still hold to our rules of magnetism that unlike poles attract while like poles repel."

Here Valvy interrupted. He just couldn't help it. "What's all that got to do with the electrical trouble shooting we are trying to learn?" Bill countered with another question.

"What makes an electric motor go?" Valvy didn't know so Bill answered the question for him. "It's nothing more or less than this magnetic attraction and repulsion we are talking about, and the same principles are used in the cutout, which by means of magnetic attraction, closes the circuit from generator to battery at the right time."

"Magnetism is not the same as electricity, but they seem to be first cousins. In a generator magnetism is used in producing electricity, while in the cutout electric current through a coil of wire produces a magnetic effect which pulls the contacts together."

"We will not worry just now about the way that magnetism produces elec-



ORDINARY STEEL BAR



MAGNETIZED STEEL BAR 4

Fig. 4

Molecular theory of magnetism

tricity, but we do want to study the methods used in magnetizing a piece of iron with an electric current, although before we do that we will consider some of the theories as to the nature of magnetism.

"One theory is that the molecules of which the iron is said to be composed, are normally turned in different directions, but that when magnetized they all point one way, much as if they were



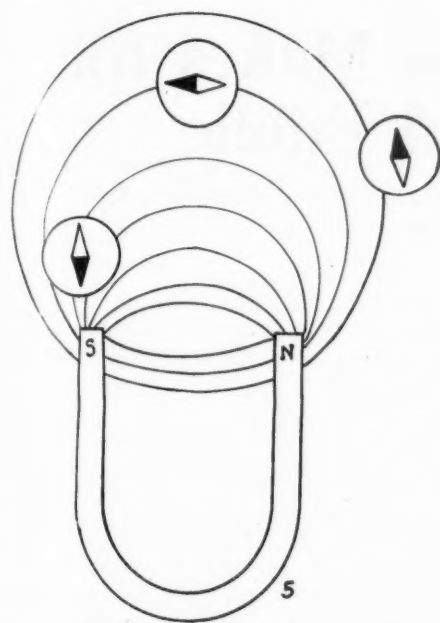


Fig. 5  
A North pole tries to move in the direction of the magnetic field

small compasses in the iron bar or horse-shoe. In Fig. 4 we have such a condition represented with two sketches. In the upper one the molecules are represented as diamond shaped particles turning in all directions, while in the lower sketch the magnetized condition is said to be due to the fact that the molecules all point in one direction.

"This action of the molecules or small particles of which the iron is composed is noticed by a magnetic condition around the magnetized piece. In Fig. 5 we have a horseshoe shaped piece of iron magnetized and the space around it is affected. We know that a magnet will pick up nails, tacks and other pieces of iron or steel, so we say that from one end or pole of the magnet to the other, there extend lines of force which leave at the north pole and re-enter at the south pole. A compass located in a magnetic field will always point along the lines of force, the north pole trying to move in the same direction as the lines are pointing.

#### Magnetizing With Electricity

"The method of magnetizing a piece of steel with an electric current is shown

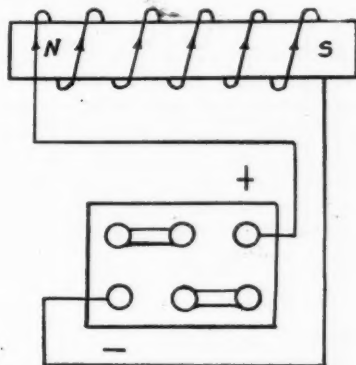
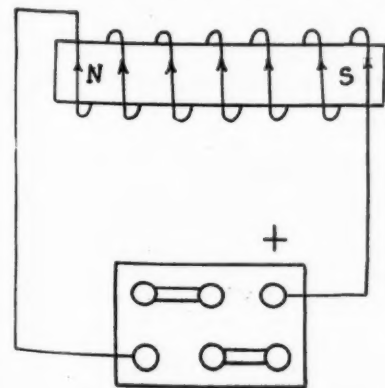


Fig. 6  
Direction of current flow in coil wound around an iron or steel bar gives a definite magnetic polarity to the bar

in Fig. 6. It will be noticed that in each case the wire is wound around the iron in the same direction, although in the right-hand sketch we started winding at the left side of the bar, while in the left-hand sketch we started winding at the right end of the bar. This has nothing to do with the magnetic effect, but the direction in which we go around the bar does affect the magnetic polarity.

"With battery connected as shown, the left end of the bar in each case will be a north pole, while the right end will be a south. The direction of the current in the turns of wire is shown by the small arrow heads, which will be seen to be the same way around the bar in each case.

"The lines of force of these two bar magnets will now leave at the north pole and go out through space and return at the south pole, traveling through the bar from S to N.

#### The Right-Hand Rule

"To determine the direction of magnetism is a bar we have what is called the right-hand rule. If with your right hand you grasp the bar with the fingers pointing around the bar in the same direction in which the current is flowing in the wires, then the thumb would point in the direction in which the lines of force are going, IN THE BAR. In this case the thumb would point toward the left, or from S to N, so we know by this rule that the north pole is at the left.

"When we have used this electrical method of making a magnet out of a piece of steel we find that it remains a magnet after we disconnect the battery. With a piece of soft iron, we can make a magnet which is even stronger than the steel one, but we find that it shows magnetic action while the current is flowing and when the battery is disconnected it loses nearly all of its magnetic properties. Only a trace of magnetism remains and we call this residual magnetism because it is a residue or that which remains after the magnetizing force has been removed. A magnet of this kind made with soft iron and depending on the flow of current to make it work we call an electro magnet."

As Bill explained various points about magnetism and how it is produced with electricity, the shop crowd listened in-

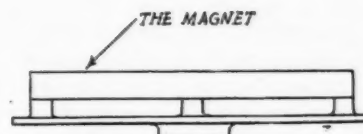
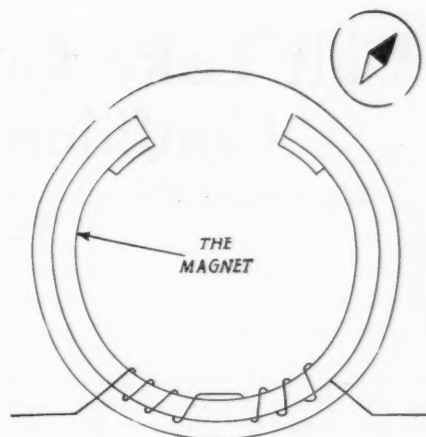


Fig. 7  
The flywheel with circular magnet

tently, and as Bill paused for a moment to get his breath, Hutch spoke up: "Couldn't you take some wire and wind it around the old circular magnet in that outboard engine, then run some current through the wire and make the magnet strong again?"

"Sure can," said Bill. "It's usually done with a U-shaped piece of iron and a couple of coils which, assembled, we call a magnetizer, but there's no reason why we can't wind some wire on the magnet itself and fix it that way."

The flywheel from the old engine is shown in Fig. 7, and in the upper view we see that the magnet is circular with a piece cut out of one side of it. In the lower view we see that it is mounted on lugs coming up from a base plate. The idea Hutch had was to wind wire around the center portion of this circular magnet, and to show the gang what could be done, Bill started right in on the experiment.

He took some cotton-covered wire out of an old field coil and wound it around the magnet as shown in Fig. 7, and then wanted to know what to do next. "Connect the battery," said the Valve Grinding Fiend.

"Which way," said Bill.

"Search me," said Valvy.

"Better find out the magnetic polarity first," volunteered the Red Head. He had seen charging jobs spoiled before by too much haste.

Red got a compass out of the stock room and held it out in the center of the floor away from all machinery. The black end of the needle pointed toward some place in Canada. Then he held it near the magnet as shown in Fig. 7, and the black end pointed away from the magnet.

"That will be about all for today," said Bill. "You fellows can figure out how we should connect a battery to charge up this old magnet, and turn in your answers next time we have a conference."

# Salt Lake City Used Car Plan Makes for Confidence of Dealers and Public

*More Cash Sales Since Appraisal Board Has Been Operating Than in Any Similar Period of Trade in That City*

By GEORGE C. HEWES

Managing Director Used Car Appraisal Board, Salt Lake City

THE used car problem seems to be the most popular subject upon which any one can write these days if he wishes to attract the attention of the automobile dealer. In fact it might be called a popular indoor sport played with enthusiasm every time a committee of automobile dealers gets together for any purpose whatsoever. A city or town which has not solved the problem these days is not much of a community.

We hear of the Saginaw plan, the Boston plan, the Appleby plan, and many others. Here is the latest and we believe the best which might be called the Salt Lake plan.

The Salt Lake City dealers have organized what is known as the Used Car Appraisal Board. The organization is controlled through a revolving board of directors composed of five member dealers who are elected by ballot to serve for a period of three, six, nine, twelve and fifteen months respectively. Every three months an election is held to elect a new director and in this manner the controlling board of directors continually revolves within the entire membership.

The plan provides that a man be hired to act as official appraiser, managing director and secretary, who will also be ex-officio a member of the board of directors. All used automobiles offered a member dealer must be appraised in the following manner:

If the used car is of the make that the dealer to whom it is offered handles as new, he shall make the appraisal himself or order an employee to do so, and at once phone the major information, such as make, type, year of manufacture, serial number and the appraisal price to the office of the managing director, mailing in the detailed appraisal on especially prepared forms provided by the association.

If the used car is not one handled by the dealer as new it must be appraised by the official appraiser. In either case the price at which the used car is appraised represents the maximum allowance and the record of the appraisal is kept alive in the appraiser's office for sixty (60) days, but in case any owner or member dealer feels that an appraisal made either by a parent dealer or the official appraiser is in any way unfair he may ask for a re-appraisal and such appraisal will be made immediately by a committee of any three available members of the board, such committee to include the parent dealer of the used car

in question, providing however, such parent dealer is a member of the appraisal board.

Each member is provided with forms on which he is required to make daily reports to the office of the managing director of all used cars bought (traded in) or sold and once each week a report is made from this office to all dealers showing a summary of all used car transaction for the week.

The most important part of the whole organization is the weekly luncheons, held Monday noon, which all members are required to attend. These luncheons are the life of the entire plan, as they serve to hold the dealers together, thereby maintaining an atmosphere of confidence in the other fellow. There are no fines other than for non-attendance of these luncheons. If any dealer thinks there has been anything off-color or a deal made that was not up to standard he speaks right up and the thing is thrashed out to the satisfaction of all concerned. This plan works out to perfection and any dealer who has tried to put anything over finds this luncheon table a very uncomfortable place to be and the only acceptable excuse he can offer for not being there is that he was ill or out of the city.

The expense of operation is pro-rated among the member dealers, each dealer paying a percentage of the total expense as represented by the number of used cars taken in by him, using the total number of used cars taken in by all dealers during the month as a whole. In this way each man pays, in proportion

to the amount of business he has done.

Once each month copies of the records on file in the office of the managing director of used cars in dealers' stock are sent out to the various dealers for correction and then a report is made showing the number of used cars and their values in the dealers' stock at the beginning of operation of the board, the number taken in, the number sold and the number now on hand all together, with their value.

This report is very interesting and shows beyond any question of a doubt that the Salt Lake City plan is a success, although we have been operating for only three months the records show that the dealers' original stock of used cars has been turned once—their stock on hand reduced 25 per cent and their used car department transformed into an asset rather than a liability.

At first the shoppers were very indignant, but they soon learned that the automobile dealers were right and were willing to admit the true value of their used cars. A great many owners got busy and sold their used cars themselves, and as a consequence there has been more clean sales, also cash sales of new cars than has been known here for many months—on the other hand the used car buyers have also learned in this short space of time the appraisal board members are taking in used cars at reasonable prices and can afford to recondition them in the proper manner, for this reason used cars taken in under the appraisal board system don't stay very long in the dealer's stock.

## 23 Years Ago This Week In Motor Age

(FROM MOTOR AGE OF JULY 26, 1900.)

### Delivered 10 Cars in a Week

PHILADELPHIA, July 23—Automobiles are becoming more and more plentiful here with each succeeding week. This can readily be explained by quoting a local dealer's statement to the effect that during last week alone he delivered no less than 10 vehicles to their owners, all of whom are Philadelphians. He further stated that he is still far behind in his deliveries.

### Progress in Chicago

It is learned from a reliable inside source that Chicago city officials are making preparations to install a number of automobiles in the municipal service.

City Electrician Ellicott, the head of the automobile licensing board, is investigating the subject, preparatory to placing the order.

### Turning Out Many Cars

Intelligence from Cleveland is to the effect that the Winton Motor Carriage Co., owing to its recent increased facilities, is turning carriages upon the market in greater quantities than ever before and can now guarantee delivery of both single and double seated carriages within 30 days from receipt of order. This company is at present engaged in broadening its field still more and hopes soon to be equipped so as to produce quantity sufficient to give immediate delivery.



# What Tire Reputation Means to the Dealer

*A Man Is Best Known by the Company That He Keeps,  
and So Is the Tire Dealer*

By CLYDE JENNINGS

Tenth Article

A TIRE went flat on the road and the driver of the automobile changed it, then stopped at the first tire store he saw to have his spare put into good condition. The tire man was rather indifferent as he removed the wheel from the back of the car and removed the cover. His interest was aroused when he saw the tire.

He looked it over, examined the name on the side, looked for the number, hit it a few times with his hammer and then asked the owner:

"Where did you get this tire? Is it a new mail order proposition?"

Right then the dealer in the automobilist's home town lost a customer. This question from the man selling tires in a bright, enterprising looking tire store put that particular tire in a class of its own so far as this car owner was concerned.

The facts are that this tire was bought for a very good tire, and likely it was. It was the product of a small factory and lacked a bit of the finish that many tires have today. This factory enjoyed a very good reputation in certain sections of the country, but the section where this one went flat was not one that had been cultivated. The tire was not known there, either to the public or the dealers.

This incident supplies an illustration of what tire reputation means to the dealer. In this day, automobiles wander far from home and the dealer who equips a car with tires never knows where judgment is going to be passed on these tires, nor where his customer is going to have a question raised as to the source of tires.

The fault in the case cited probably is due to both manufacturer and dealer—to the manufacturer because he had not established a trade reputation for his tires and to the dealer because he had not properly sold his customer.

A different sort of a case is recalled.

A few years ago in a mid-western city a very large business establishment added tire making to its various industries and, strange to relate, devoted its first merchandising efforts solely to the home city. No effort was made during the first few months to extend distribution, which has been later accomplished.

One of the pioneer dealers in this particular tire took extra pains to tell to each new customer exactly the situation as to the tires. The customer was told who made the tires, that this was a new venture and that sometime later a wider distribution would be sought, but at present these tires were sold only in that city.

The users of these tires, like users of other tires, went touring. They were confronted with questions as to source of the tire, the price and many other questions. The difference between these persons and the hero of the first incident related, is that these tire users had been warned in advance, they were rather proud of the fact that they were pioneering in tires for a great manufacturing concern that was widely known for other lines, and so they assumed this pride in answering the questions.

The result is obvious. In the first case the tire and the dealer got a black eye. In the second case, the tire got considerable advertising through answers to the questions and the dealer heard many

interesting stories of how they spread the news of this wonderful tire. It happened that this was a good tire and made friends readily.

And so we say this to dealers:

Sell only good tires and if for any reason the tire that you sell is not widely known, tell your customers why it is not, so that some other tire man in quest of information will not kill your product.

The average dealer will say that the building of a reputation is a job for the factory. And to a certain extent he is right about this but not entirely so.

There are none of us today who would want to go on record as saying that no new tire companies will develop in the future, or that none should develop. That would mean that the tire business is going to remain always in the same hands as now. We can hardly expect that.

Men are only human and the business enterprises are little more than human. The difference is that one man seldom has the entire say as to the policies of a business. It is an old saying and true that in a multitude of counsel there is wisdom. And so it happens that businesses that are managed by a group of men make fewer mistakes than a business that is managed by only one man.

It is history, however, that even selected groups of men will make mistakes and so in the course of time the trade leader of one period becomes the follower in the succeeding period and a big smash often removes a leader. And so we expect to see some tire makers go up the ladder and others down. The rivalry and the change gives spice to business life and it will be many years before the tire business loses all of its spice or speculation.

It is inconceivable that tire dealers will not change lines over a period of years. All will not, but many will. Some retail merchants rise and fall with one concern, while other dealers are keeping an ear to the ground and an eye in the business papers, and from what they see and hear make such changes from time to time that keeps them on the top wave.

These are not the dealers who change for the love of making a change, but they change when they have good and sufficient reason and this reason is weighty enough to make it reasonable for them to pay the cost of the turnover, for each change costs money at the time it is made, regardless of the profit it may bring in the long run.

When the dealer makes this change is the time for him to consider the reputation of the tire that he is going to sell and fit his sales policy to the tire. Obviously the same sales talk will not fit a tire that has never been advertised as one that is advertised in all popular mediums. A tire that is just being put on the market needs a different personal introduction to the motorist than a tire that has been known wherever cars run for a dozen years.

The choice of a tire to sell is something that the dealer should consider long and well and the reputation of the tire and the manufacturer should govern his method of sales. These points should be the chief points of consideration in planning the method of selling the tires to the public.

*The first nine articles of this series were published as follows:*

*May 24—Now Is the Time to Add Tires to Your Transportation Store.*

*May 31—Tire Sales Not "Small Change," Totals Run Large.*

*June 7—What Tire Makers Are Doing to Make Tire Selling a Better Business.*

*June 14—Some Things the Tire Manufacturer Can Do to Improve Tire Merchandising.*

*June 21—Competition You Must Expect in Tire and Some Suggestions.*

*June 28—What the Tire Dealer Can Do to Promote Tire Trade.*

*July 5—Long Dating on Tire Sales Is Destructive to Tire Merchandising Success.*

*July 12—The Mechanical Side of the Tire Dealers' Business.*

*July 19—Why Some Tire Dealers Do Not Make Money.*



The national advertising of tires divides these tires into groups by the nature of the text, appearance of their advertising and by the publications in which it appears. A tire dealer who is opening a store in an industrial community where, as a rule, cars are small and the economic situation thrifty, would be foolish to make his leader a line of tires that is advertised on a quality and social basis.

### *The Market Should Determine the Line*

For the same reason, a dealer who is opening a store in the exclusive or gold coast section of a city would be equally foolish to pin his faith on a brand of tires that was known as a price commodity. The fitness of the merchandise to a community and its needs is quite important and the dealer who ignores this point is going to run into trouble sooner or later.

Another point that might well be taken into consideration is the sales competition that the dealer will meet from the company that manufactures the tires that he sells. We believe that there is coming a day when the reputation of the manufacturer for cutting prices to department stores, gyms and mail order houses will be one of the basic considerations that will decide dealerships. It is true that most of this gyp stuff is sold under other names, but there is little to bar the dealer from learning who made it.

It is nearly always the case that when the department store or gyp stages a bargain sale, he tells his purchasers confidentially what company made the tires that he is selling and he nearly always adds "they are just as good as the regular tires they make and advertise."

Some day there is going to be organization among tire dealers and then such information as this will be discussed in the meetings, and the dealer can learn who makes these tires that are unfair price competition.

With this information at hand, it will be up to the dealer to decide whether he will handle a line that supplies the ruinous competition. Many a tire dealer has gone broke because his own line of tires were being sold to the public at less price than he was paying the factory.

And that is one of the chief reasons why a merchant should think twice before putting himself in the position of having only one line of tires and nothing but that line of tires to sell.

The suggestion out of all of this is:

**Look well into the history and reputation of a tire before pledging your capital and efforts to building up its reputation in your community in connection with your own name.**

A dealer in a representative community was asked recently how many of the cars that drove up to his store had four tires of the same kind—not counting of course cars that had not yet worn out the original equipment.

"Not more than 5 per cent," was the astonishing answer. And this dealer is generally regarded as being above the average on his hold among his customers.

His explanation is that a tire purchase is usually an emergency purchase. That the car owner buys his tire when and where he is forced to buy and while many of these people come to his store regularly for repairs, for tubes and other merchandise, they often come apologizing for the fact that they have had to buy a casing when on a trip. This man has not been able to put over to his entire satisfaction the selling of a spare to his trade. **The spare, he says, is the only solution of keeping four or five of his tires on a single car.**

Then, too, this dealer has some ideas of his own regarding the sale of tires. Some of his regular customers have not the same kind of tires on their cars. He believes that on some of the old cars it is rather unwise to continue selling these owners first class cord tires. To these people he sells fabrics when he might have made the sale of a cord to match the others on the car. Also he often urges certain people to buy good second hand tires and on these he sometimes gives a guarantee.

He says further that few people come to his store asking for a certain brand tire. He does not believe that consumer advertising has been sufficiently convincing to turn public attention to any one tire. The public has certain ideas as to groups of good tires, but he says that a dealer can swing these buyers if he works hard enough on the selling job.

The most persistent demands for certain brands that come to his store, he says, comes from the farmers who have read the glaring advertisements in the farm papers. He recalls the numerous calls he had for a certain tire that centered its

advertising on the farm papers circulated in that community. This tire, the manufacturer of which has since failed, was not a good tire and he knew it and could prove it by the tire itself, but he was not able in all cases to turn the demand. This advertising was chiefly adjectives and PRICE. The impression was made on those who had been buying mail order tires.

This dealer is quite a successful tire merchant. He says that he frequently sells two tires to a customer, but very seldom sells four or five. But the fact that he makes a large number of two tire sales marks him as an exception.

Clean cut national advertising is an asset, we believe, to every dealer handling a tire so advertised. Tire manufacturers who have national distribution, and some that have not, have been liberal customers of advertising mediums. There are a number of tires that are known throughout this country and the national advertising has made the name an asset. There is an advantage in offering to sell to the casual customer a tire that he knows of, either by advertisements or by experience.

The manufacturers of these tires usually ask their dealers to operate on a smaller discount than do manufacturers of lesser known tires. They would appear to be justified in so doing, as the less the sales resistance, the easier to sell the article, consequently a less expense.

A stranger driving into a town sees three tire stores. One of them is marked as the retailer of a nationally advertised tire. Another has a tire that the driver has heard something of, the third has a tire with only a local reputation.

Which store would you say will get the stranger's business?

**An article of this kind would be incomplete without a suggestion of the type of dealer who cares not for his own or the factory reputation. There are such, but we believe that their fault is weakness, rather than viciousness.** A member of the MOTOR AGE staff recently noted a store that looked well, so he investigated it. We print here his report:

### *He Advertised His Competitors' Tires*

"At first glance the establishment of this tire merchant presented a rather pleasing appearance. In front of the curb was an enormous pneumatic truck tire, set in a concrete block with a tire hose supported on it for all to use.

"The general appearance of the window layout was good, and the Goodrich tires handled were prominently displayed. Also a sign on the window and another hanging over the side walk showed that Goodrich tires were sold there.

"At one side of the show window however was a Michelin tire man, the base of his pedestal recommending Michelin tires and tubes. Inquiry inside the store developed the fact that no Michelin products were sold, but that the man had been left in the window because it might attract attention.

"The window showed two cardboard sets showing Federal tires. However, Federal tires were not sold there.

"At another place in the show window was a good looking disk wheel in which a Fisk tire was mounted, while the big truck tire out in front was a General cord, and neither of these makes were handled.

"This man displaying so many different makes of tires is certainly charitably inclined, for he apparently believes in advertising his competitors' goods as well as his own. When the question was brought to the attention of this dealer's salesman, he advanced the alibi that you had to give people what they asked for, and we have visions of his sending a boy post haste out the back door, to get a casing or tube from a competitor, just because a customer asked for it.

"Perhaps this tire dealer never heard of the principle that to sell a thing right you should first be sold on it yourself. If he sells tires it must be to those in distress in the vicinity of his shop, or because of the goodwill built up by the concern whose product he handles. It is certainly not due to his own ability as a merchant."

The value of advertising and reputation does not appeal to some merchants, however. We have in mind an automobile dealer who rented a 100 foot sidewalk to a sign company for use in advertising a car competitive to the one that he sold.

That sounds very funny, of course, but the same thing is repeated in dozens of cases in tire stores and it is not so funny because dealers and people generally do not ascribe the individuality to tires that they do to the cars.

Next week—Don't Give Profits Away; Demand Honest Pay for Honest Tire Service.

# Illinois Highway Commission Conducts Ideal Road Test

## Sixty-three Sections of Pavement Subjected to Maximum Traffic Strain

(Reprinted From Concrete Highway Magazine by Courtesy of Portland Cement Association.)

FOR nearly three years articles have been appearing in technical magazines and newspapers describing an experimental highway of unprecedented magnitude. It was conceived and constructed by the Division of Highways of the State of Illinois to furnish reliable information to be used in designing the pavement for 5,000 miles of state highways. From its location the scene of the test become known as the Bates Experimental Road.

The test road consisted of sixty-three sections of pavements each 18 feet wide and from 100 to 250 feet in length, laid end to end, so that they made a continuous straight pavement two miles long. Twenty-two of these sections were of brick, seventeen of asphalt and twenty-four of concrete. In each type of pavement the sections varied from those so thin they were sure to break under the lighter test loads to sections which were considered strong enough to support successfully the heaviest loads permitted by the state traffic laws.

All the materials for the pavements conformed to the very high standards required by the state specifications. The spirit of the whole test was "Learn the Facts."

Over this pavement a fleet of army trucks made 23,200 round trips. Beginning with the bare chassis, loads were increased in 2,000 pound increments until a gross load of 10 tons was reached. The greatest traffic imposed upon any section was 377,460 tons, of which 52.6 per cent was the state's legal load limit of four tons per rear wheel. A summary of the test traffic is given in the accompanying table.

Increment	Load in Pounds on Each Rear Wheel	Load in Pounds on Each Front Wheel	Gross Load	Net Carried or Live Load in Pounds	Number of Round Trips	
					Day	Night
First.....	2,500	2,250	9,500	....	1,000	....
Second.....	3,500	2,150	11,300	....	2,167	1,033
Third.....	4,500	2,000	13,000	1,700	2,000	1,000
Fourth.....	5,500	1,900	14,800	3,500	2,000	1,000
Fifth.....	6,500	1,800	16,600	5,300	2,000	1,000
Sixth.....	8,000	1,930	19,860	8,560	5,000	5,000

Although a thorough study of the results of the traffic runs has not yet been made, the following general comparison seemed justifiable to Chief Highway Engineer, Clifford Older.

### Bituminous Filled Brick on Macadam Base

"A difference in the thickness of the brick or type of brick apparently had no effect upon the load supporting capacity



General view of the Bates Road from the observation tower at the east end

of these sections. All five sections failed at approximately the same time and to the same extent."

### Asphaltic Concrete on Macadam Base

"No consistent ratio of strength to thickness of base appears. Apparently traffic supporting capacity increases with an increase in thickness of asphaltic top. The evidence supporting this point is not conclusive, however."

### Asphaltic Concrete on Concrete Base

"The assumption made at the beginning of construction, that an asphaltic concrete wearing surface on a concrete base would have a traffic supporting ca-

capacity equal to that of a concrete pavement having a thickness equal to that of the base plus one inch seems to have been a fair guess. It is further evident that increased base thickness is accompanied by increased strength."

### Bituminous Filled Brick on Concrete Base

"The original assumption that a bituminous filled brick wearing surface on a concrete base has a strength equal to that of a concrete slab having a thickness equivalent to that of the base plus one-half the thickness of the brick surface was apparently incorrect. In practically every instance the concrete pavement sections proved of greater strength than their supposed equivalent in bituminous filled brick."

### Monolithic Brick

"The original assumption that the brick surface in this type of pavement acts as a unit with the concrete of the base, thus forming a truly monolithic slab having the same carrying capacity as an equal thickness of concrete, was disproved early in the traffic tests. It was clearly evident that the strength of a so-called monolithic section was less than that of a concrete section of the same thickness."

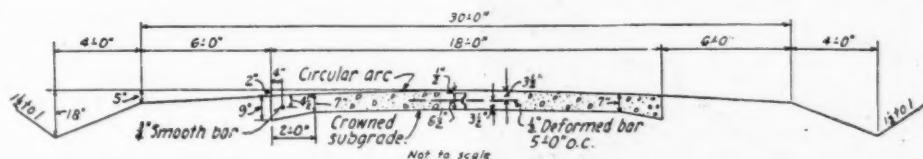
"In comparing an added inch of brick with an added inch of concrete base, the total thickness remaining the same, it was noticed that the thicker base section has the advantage."

### Concrete

"Soon after starting traffic it developed that the section containing special cements or other chemicals showed less strength than plain concrete sections of the same thickness."

"Sections containing certain special features of design consisting of transverse and longitudinal joints with marginal steel, showed greater strength than plain concrete sections of the same thicknesses."

The table summarizing the results of



This cross-section for concrete roads is one of those adopted by the Illinois Division of Highways as a result of the traffic tests on the Bates Experimental Road. Thickened edges and the center joint are also specified for concrete bases under asphalt tops. The center joint with uniform base thickness is specified for brick pavement





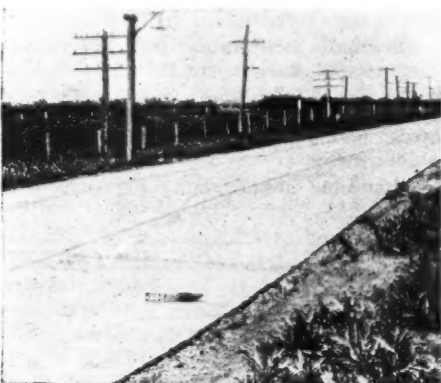
During the night run the road was illuminated with electricity to enable the drivers to follow the prescribed path

the traffic test shows that two asphalt, one brick and ten concrete sections carried the entire test traffic without a decisive failure. All the concrete in these thirteen successful sections, whether in a concrete base or concrete pavement, was proportioned 1:2:3½.

This overwhelming victory for concrete pavements is better realized when expressed as a percentage: 4½ per cent of the brick, 11¼ per cent of the asphalt and 41 2-3 per cent of the concrete sections satisfactorily sustained the entire test traffic.

Five new sections each 350 feet long have been built and will be subjected to test traffic this spring. These new sections have thickened edges similar to those shown in the accompanying cut. These sections of the original road which did not fail in the first test and sections which could easily be patched will also be subjected to the new traffic. It is significant that the material of which these new sections are built—the only material to reach the "Finals" in the test—is concrete.

As a result of the Bates Road test the state has already changed its design for concrete pavements and for concrete bases under black top pavements to a cross section with thickened edges. Other states are watching these developments with interest.



Section 40 Bates Road in the foreground looking toward 41, 42 and 43. These sections carried all the traffic without failing

## BATES EXPERIMENTAL ROAD

### Results of Traffic Test

SECTIONS LISTED UNDER INCREMENT DURING WHICH FAILURE OCCURRED

Increment Under Which Failure Occurred	Section No.	Type	Surface	Base	Cushion Inches	Total Thickness Inches
First	10	Asphalt on Gravel.....	2-in. Topeka.....	4-in. Novoculite.....		6
	33	Monolithic Brick.....	3-in. Brick.....	2-in. 1:2:3½ Conc.....		5
	59	Concrete, Cemite Cement..	4-in. 1:2:3½.....			4
Second	1-A	Bit. Filled Brick on Macadam	3-in. lug.....	4-in. Macadam.....	2	9
	1-B	Bit. Filled Brick on Macadam	3-in. lugless.....	4-in. Macadam.....	2	9
	2	Bit. Filled Brick on Macadam	4-in. lug.....	4-in. Macadam.....	2	10
	3	Bit. Filled Brick on Macadam	4-in. lugless.....	4-in. Macadam.....	2	10
	4	Bit. Filled Brick on Macadam	4-in. lug.....	8-in. Macadam.....	1	13
	5	Bit. Filled Brick on Macadam	3-in. lugless.....	8-in. Macadam.....	2	13
	7	Asphalt on Macadam.....	2-in. Topeka.....	8-in. Macadam.....		10
	11	Asphalt on Macadam.....	2-in. Topeka.....	4-in. Macadam.....		6
	26-A	Bit. Filled Brick on Conc.....	4-in. lug.....	4-in. 1:2:3½ Conc.....	1	9
	27	Bit. Filled Brick on Conc.....	3-in. lug.....	4½-in. 1:2:3½ Conc.....	1	8½
	29-A	Bit. Filled Brick on Conc.....	3-in. lug.....	4½-in. 1:3:5 Conc.....	1	8½
	30	Bit. Filled Brick on Conc.....	3-in. lug.....	3½-in. 1:2:3½ Conc.....	1	7½
	32-A	Bit. Filled Brick on Conc.....	3-in. lug.....	3½-in. 1:3:5 Conc.....	1	7½
Third	56-B	Concrete, 2½% Calc. Chloride	5-in. 1:2:3½.....			5
	61-A	Concrete, 7½% Hydr. Lime	4-in. 1:2:3½.....			4
	62	Concrete (see Footnote No. 4)	4-in. 1:2:3½.....			4
	6	Asphalt on Macadam.....	2-in. Topeka.....	10-in. Macadam.....		12
	28	Bit. Filled Brick on Conc.....	3-in. lugless.....	4½-in. 1:2:3½ Conc.....	1	8½
	34-A	Semi-monolithic Brick.....	3-in. Brick.....	2-in. 1:2:3½ Conc.....	¾	5¾
	35	Monolithic Brick.....	4-in. Brick.....	2-in. 1:2:3½ Conc.....		6
	36	Monolithic Brick.....	3-in. Brick.....	3-in. 1:3:5 Conc.....		6
	37	Monolithic Brick.....	3-in. Brick.....	3-in. 1:2:3½ Conc.....		6
	38	Monolithic Brick.....	4-in. Brick.....	3-in. 1:2:3½ Conc.....		7
	55	Concrete.....	5-in. 1:2:3½.....			5
	56-A	Concrete, 4% Calc. Chloride	5-in. 1:2:3½.....			5
	57	Concrete, Cemite Cement.....	5-in. 1:2:3½.....			5
Fourth	60	Concrete, 2½% Calc. Chloride	4-in. 1:2:3½.....			4
	61-B	Concrete, Plain.....	4-in. 1:2:3½.....			4
	9	Asphalt on Macadam.....	2-in. Topeka.....	6-in. Macadam.....		8
	12-A	Asphalt on Concrete.....	2-in. Topeka.....	4-in. 1:3:5 Conc.....		6
	13	Asphalt on Concrete.....	1½-in. Topeka.....	4-in. 1:3:5 Conc.....		7
	14	Asphalt on Concrete.....	2-in. Topeka.....	4-in. 1:2:3½ Conc.....		6
	15	Asphalt on Concrete.....	1½-in. Topeka.....	4-in. 1:2:3½ Conc.....		7
	18	Asphalt on Concrete.....	1½-in. Topeka.....	5-in. 1:2:3½ Conc.....		8
	39	Monolithic Brick.....	4-in. Brick.....	4-in. 1:3:5 Conc.....		8
	54	Concrete, Plain.....	5-in. 1:2:3½.....			5
	58	Concrete, Plain.....	4-in. 1:2:3½.....	4-in. Crushed Stone.....		8
	8	Asphalt on Macadam.....	1½-in. Topeka.....	5-in. Macadam.....		8
	16	Asphalt on Concrete.....	2-in. Topeka.....	5-in. 1:3:5 Conc.....		7
Fifth	29-B	Bit. Filled Brick on Conc.....	3-in. lugless.....	4½-in. 1:3:5 Conc.....	1	8½
	32-B	Bit. Filled Brick on Conc.....	3-in. lugless.....	3½-in. 1:3:5 Conc.....	1	7½
	44	Concrete, Plain.....	7-in. 1:2:3½.....			7
	45	Concrete, Circumf. Reinf.....	6-in. 1:2:3½.....			6
	53	Concrete, Wire Mesh Reinf.....	5-in. 1:2:3½.....			5
	17	Asphalt on Concrete.....	2-in. Topeka.....	5-in. 1:2:3½ Conc.....		7
	19	Asphalt on Concrete.....	2-in. Topeka.....	6-in. 1:3:5 Conc.....		8
	20	Asphalt on Concrete.....	2-in. Topeka.....	6-in. 1:2:3½ Conc.....		8
	23-A	Bit. Filled Brick on Conc.....	3-in. lug.....	6½-in. 1:2:3½ Conc.....	1	10½
	23-B	Bit. Filled Brick on Conc.....	3-in. lugless.....	6½-in. 1:2:3½ Conc.....	1	10½
	24	Bit. Filled Brick on Conc.....	3-in. lug.....	5½-in. 1:2:3½ Conc.....	1	9½
	26-B	Bit. Filled Brick on Conc.....	4-in. lugless.....	4-in. 1:2:3½ Conc.....	1	9
	31	Bit. Filled Brick on Conc.....	3-in. lugless.....	3½-in. 1:2:3½ Conc.....	1	7½
Sixth	51	Concrete, Wire Mesh Reinf.....	6-in. 1:2:3½.....			6
	52	Concrete, Plain.....	6-in. 1:2:3½.....			6
	21	Asphalt on Concrete.....	2-in. Topeka.....	7-in. 1:2:3½ Conc.....		9
	22	Asphalt on Concrete.....	1½-in. Topeka.....	8-in. 1:2:3½ Conc.....		11
	25	Bit. Filled Brick on Conc.....	3-in. lugless.....	5½-in. 1:2:3½ Conc.....	1	9½
	40	Concrete, Plain.....	9-in. 1:2:3½.....			9
	41	Concrete, 9 by 25-foot slabs	8-in. 1:2:3½.....			8
	42	Concrete, Plain.....	8-in. 1:2:3½.....			8
	43	Concrete, 9 by 25-foot slabs	7-in. 1:2:3½.....			7
	46	Concrete, Circumf. Reinf.....	6-in. 1:2:3½.....			6
	47	Concrete, Circumf. Reinf.....	6-in. 1:2:3½.....			6
	48	Concrete, Circumf. Reinf.....	5-in. 1:2:3½.....			5
	49	Concrete, Circumf. Reinf.....	5-in. 1:2:3½.....			5
No Decisive Failures	63-A	Concrete (see Footnote No. 4)	7-in. 1:2:3½.....			7
	63-B	Concrete (see Footnote No. 4)	7-in. 1:2:3½.....			7

Sections 41, 43, 45, 46, 48 and 49 have transverse joints every 25 feet and a longitudinal joint the full length of section.

Sections 47 and 50 have transverse joints every 25 feet but no longitudinal joint.

Sections 55 and 63A were made with gravel aggregate. All other concrete sections with crushed stone aggregate.

NOTE 1—Transverse and longitudinal joints were formed by setting on edge strips of horizontally corrugated 16-gauge galvanized iron 6 ft. long and 1 in. less in width than the thickness of the pavement. Width of corrugation 3 in.; depth 1 in.

NOTE 2—All bar reinforcement consisted of ¾-in. round deformed bars placed 2 inches from the top of the slab and 6 inches in from the edges of the section with a 3-inch lap at intersections.

NOTE 3—Weight of wire mesh approximately 45 lbs. per 100 sq. ft. Total effective sectional area in square inches per foot parallel to center line was 0.093 and per foot of width was 0.087.

NOTE 4—Longitudinal joint full length of section; ¾-inch deformed bars 5 feet long and 10 feet centers across longitudinal joint; ¾-inch plain round painted bar 6 inches from each outside edge of slab; continuous through sections 62, 63-A and 63-B.



# Motor Age, Visitors and Letters

PERHAPS you have noticed that in recent issues MOTOR AGE has gone very strongly into the question of the cost of doing business, generally called overhead. The MOTOR AGE staff believes that with the increase of equipment and the sharper competition in merchandising in automotive lines it is hopeless for a man to attempt to do business in this line without knowing what it is costing him to do business. Consequently we are trying to educate dealers in all lines of automotive merchandising, especially as to labor hours, or maintenance, or repairs or whatever you may prefer to call it, as a factor in their business.

This is going to be a good part of the program of the MOTOR AGE Editorial department for the next several weeks. Naturally we were greatly pleased to receive the following comment from a MOTOR AGE reader on renewing his subscription:

Newton Falls, Mass., July 16, 1923.

Editor MOTOR AGE:

Learn the difference between overhead and turnover and expound the same from Dan to Beersheba. Overhead naturally increases with an increase of business. Turnover bears relation to interest on capital invested.

Obviously if one's overhead should be 25 per cent of sales (and it's often more) then the more business one does at 10 per cent in order to increase turnover, the sooner that gentleman who sometimes hangs people will appear and take entire charge of activities.

At the present time there's a large flock of salesmen (?) prancing through the sticks, preaching "Cut prices and make up your loss of profits on increased turnover." From the number of boobs who are falling for this cant, I think you had better go after us as hard as the Metal Worker did a few years since. I have a more selfish object in view in being in business than just to keep some factory running.

WE hope that you have been reading the flat rate articles in the last few issues of MOTOR AGE. We believe that there is a great deal of education for the average maintenance man in the information which Mr. Dumas has gathered from many sources.

These articles have brought out some very interesting comment. The following letter was received as a reply to an editorial which compared the automotive maintenance shop with a jewelry shop. It reflects the attitude of some maintenance men towards the flat rate method of selling repairs:

Bridgeport, Conn., June 26, 1923.

Editor MOTOR AGE:

I am very glad to say that without doubt your publication presents more of real value and interest to the repairman than any other paper I have read, but some of the things you advocate surely "get my goat." Naturally because I am a repairman the flat-rate-piece-work combination is a red flag to me.

Please do not compare our work to that of the barber, the shoemaker and the watch repairer of the present-day school. I know we are bad enough, but not, I hope, bad enough to be classed with these presto mechanics.

I note you say that the backward maintenance dealers say of the flat rate plan, "It can't be done." Why call him backward when he tells the truth as he sees it. These fellows who claim to be repairing automobiles on a flat rate plan are having a hard time making good their claims, and to my mind many are just plain fakers, that is, assemblers masquerading under the guise of repairmen.

I know of dealers who have made a heap of trouble for themselves by installing factory-recommended repair plans, and I also know car owners who have been badly stung due to the working of certain flat rate plans. Believe me there are just as many kickers, or more, when this cure-all is being used as a basis for repair work charges.

Let us for a moment talk over the watch repair business which you offer as an example of the flat rate plan. A number of years ago I bought a good-grade watch which I supposed would, judging from the price I paid, give at least fair service. For a year or so all was lovely and then I broke the crystal and my trouble started. Back to the jeweler that sold me the watch (one of the biggest in New York City) I went. I got the flat rate price for the work and had the job done; but for some reason the watch did not keep as good time as before. This was repeated several times.

As the days passed I found myself in another city and thinking that I might get better results here, I looked up the agent. Result: another flat rate charge for parts, etc., but no improvement in running. This continued off and on, as the urge for accurate time would dictate, for about ten years.

I was about ready to give the old one to the children to play with when one day I heard some old men talking about a watch repairman who had taken care of their watches for the past 40 years. Inquiry revealed that these watches were still keeping good time.

I then decided to give the old repairman my watch for his flat rate price if

he could not fix it. Much to my surprise, after he had looked the watch over and remarked that it had been much abused, he said he could fix it and to call around in a few days.

"Yes," I said, "but how much will it cost," and this unbusinesslike old man answered:

"I can't tell until the watch is fixed."

"What," I thought, "no flat rate for fixing a watch! Well, I suppose it is because he is an old man and doesn't know good business methods."

But when I asked when it would be ready I got another shock, because the answer was:

"When it's finished."

I suppose I should have taken my watch and walked out then, but this was the last stop, so I followed his advice and dropped around the following week to see how he was making out. Much to my surprise I found my watch ready and paid \$2 for the work done. I was told that it kept pretty good time now. And believe me it did and still does, that being over two years ago.

In the meantime the old repairman has passed away and when the watch again goes wrong it too must be laid away, as the only real watch repairman in the city has gone to his just rewards. Those that are left are just assemblers, not repairers of watches.

This little story, I believe, illustrates a part of the service business which your paper has failed to consider. The trouble with the automobile service business is lack of good repairmen—not lack of proper methods of charging for the work done. I believe that, only as well-trained repairmen who can and will take a master workman's pride in their trade are produced, will the question of good service be answered.

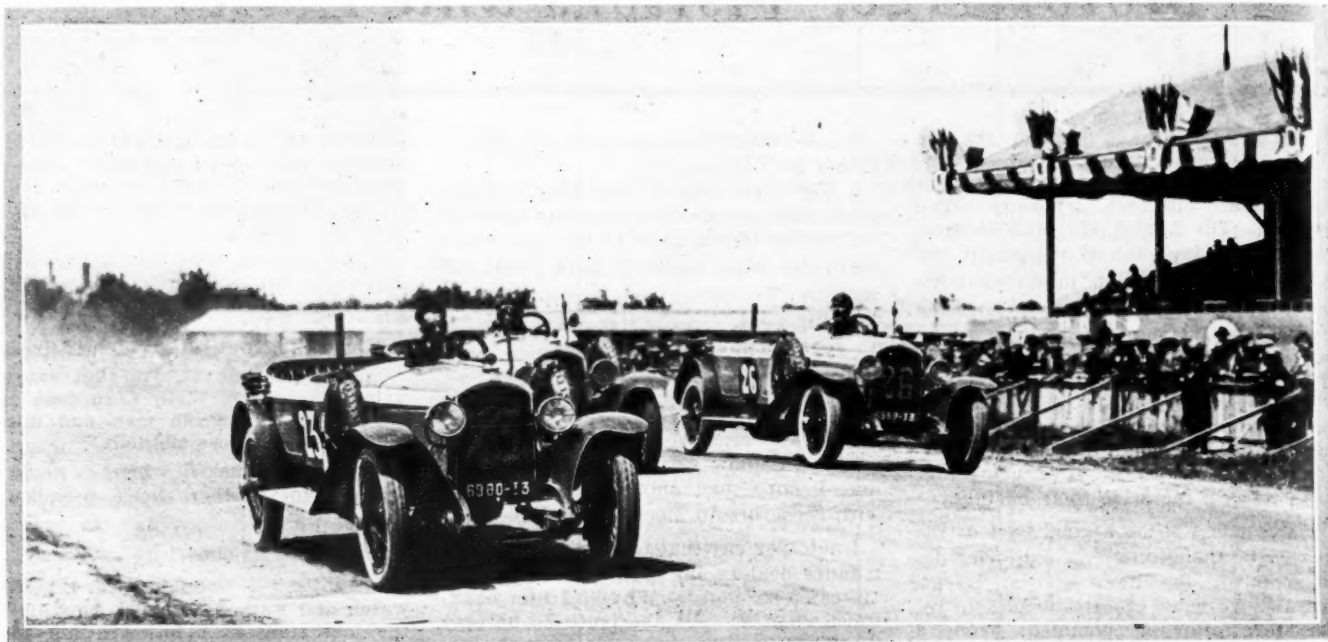
In the hope of better service tomorrow, I am

Yours very truly,

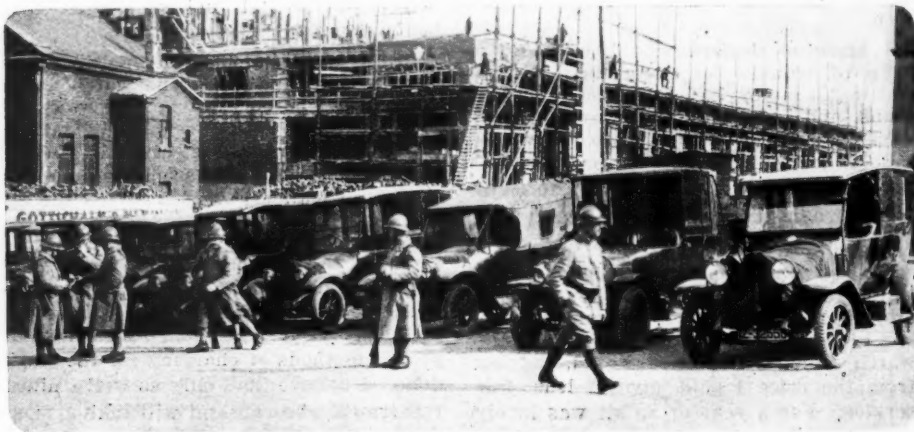
E. F. Phelps.

IN reply to Mr. Phelps we asked him if he thought that this man would necessarily not have been a good jeweler if he had known how to charge for the work he did by the job. And still there is a point made in Mr. Phelps' letter well worth considering. Perhaps when a car comes in that has been very greatly neglected—the brakes frozen and a lot of things like that—it may be necessary to do this particular job on time instead of flat rate. However, we think the owner would be better suited if he were given a price for the job even if that price were sufficiently high to cover all the rest of the job.

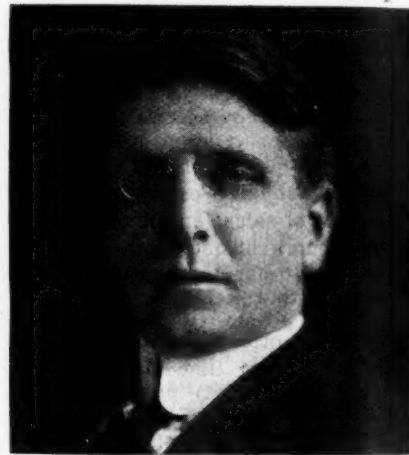
# MOTOR AGE'S PICTURE PAGES



*They certainly must build 'em all alike in the Peugeot factory over in France. This shows the finish of the fuel economy race held over the French Grand Prix course which was won by Andre Boillot. His team mates finished less than a car length behind him.*



*A French soldier was shot, and died of his wound, while working at the Essen railway station. Three Germans, found in the neighborhood as well as the drivers of these cars were arrested and the cars are being guarded while the drivers are held in prison until they divulge the name of the murderer*



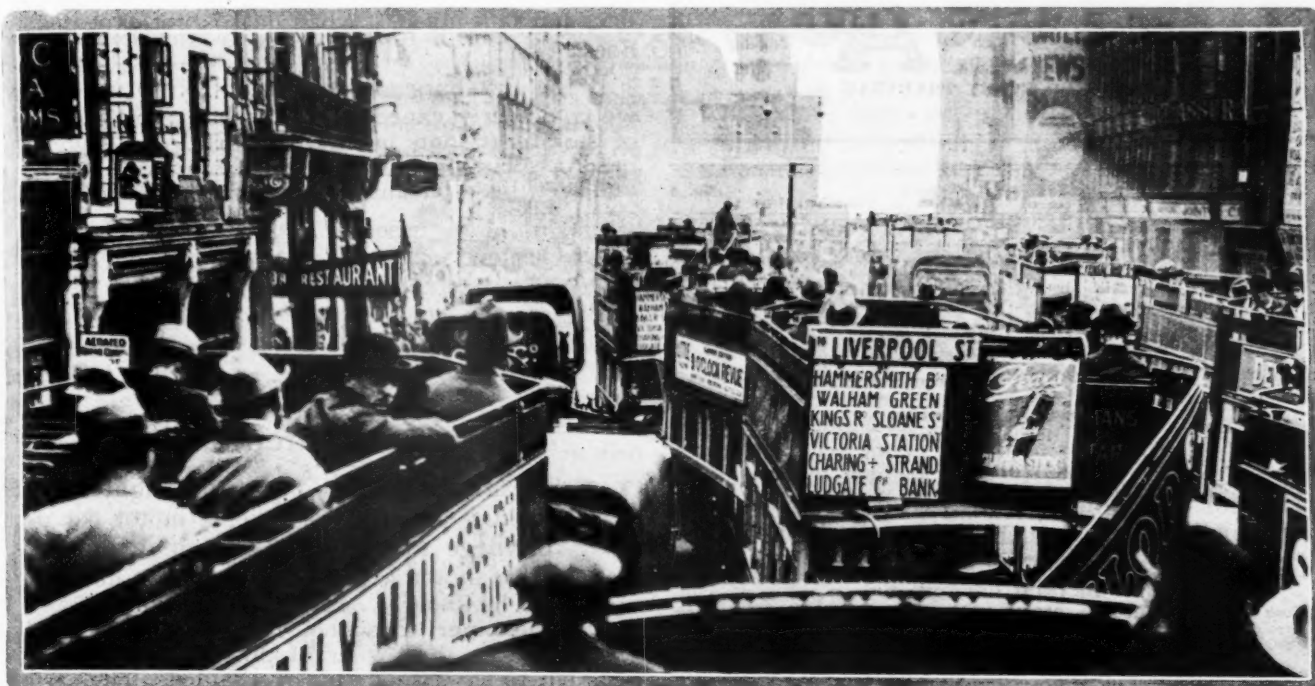
*John N. Willys, President of Willys Overland, Inc., who says that the first million is the hardest and is now working hard on his second million cars*



*An unusually good view of the Kansas City Race just before the start. The panoramic camera gave a misleading effect*



# OF AUTOMOTIVE INTEREST



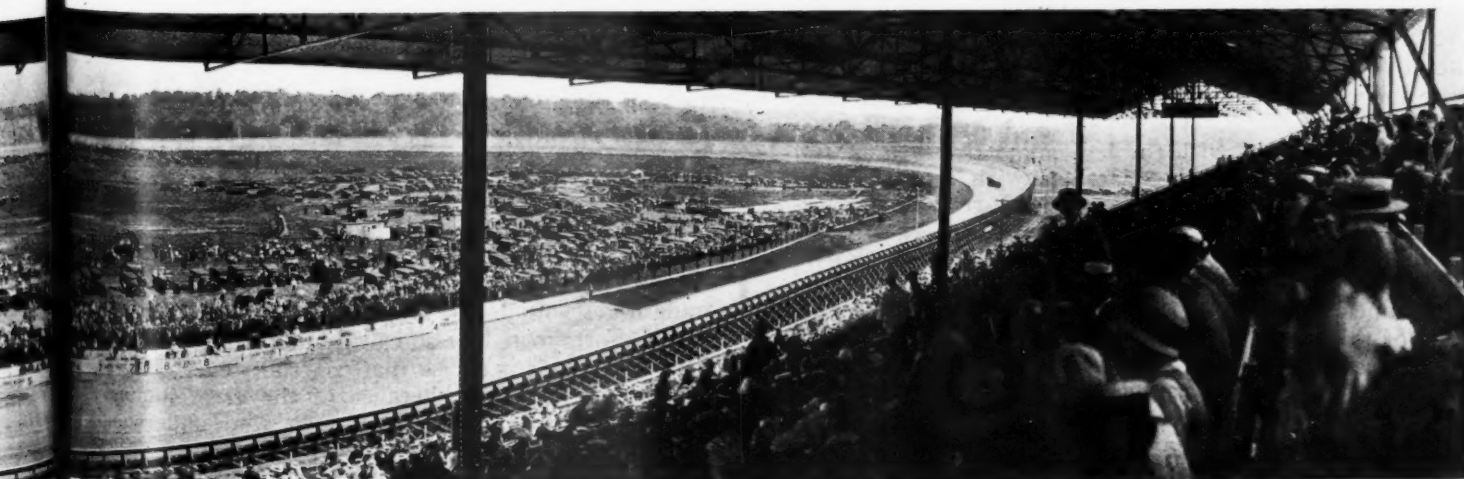
London, England, thoroughfares have been called the streets of crawl and chaos and it has been said that 20,000,000 pounds are being lost every year through the hopeless delay in street traffic. This is a typical view of the traffic congestion on The Strand, as it appears on any week day



Although club races and hill climbs have almost disappeared in this country, they are still rampant in England. The picture shows Miss Clark winning the "Ladies' Cup" in the Middlesex County Automobile Club's hill climb at Hondport Hill

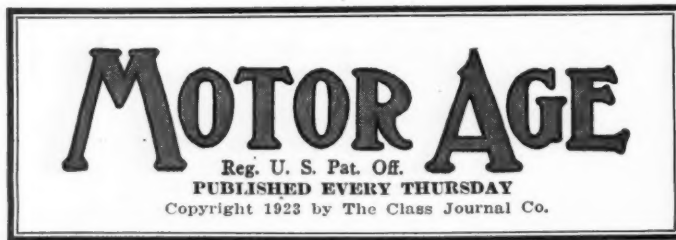


Philippine athletes arriving in Osaka, Japan, to compete in the eastern Olympic Games. From the number of automobiles shown one would think this was a western city instead of one where the duty on a Ford, plus the freight, is equal to the original cost in Detroit



However, the grandstand and the home stretch being straight and not curved as they appear to be





Vol. XI:IV

Thursday, July 26, 1923

No. 4

## THE CLASS JOURNAL COMPANY

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### SUBSCRIPTION RATES

United States, Mexico and U. S. Possessions.....	\$3.00 per year
Canada.....	5.00 per year
All Other Countries in Postal Union.....	6.00 per year
Single Copies.....	35 cents

Subscriptions accepted only from the Automotive Trade

Owned by United Publishers Corporation, Address 239 West 39th St., New York; H. M. Swetland, President; Charles G. Phillips, Vice-President; A. C. Pearson, Treasurer; Fritz J. Frank, Secretary.  
 Entered as second-class matter Sept. 19, 1899, at the post-office at Chicago, Ill., under the Act of March 3, 1879.  
 Member of Associated Business Papers, Inc.  
 Member of the Audit Bureau of Circulations.

## Getting Down to Facts

THE Greater Pittsburg Tire Dealers' Association is getting down to facts in the matter of some tire advertising that was disturbing the tire market in that community. According to an announcement made through the National Tire Dealers' Association of 242 West 56th street, New York City, the Pittsburg Association made a definite examination of a tire that was being advertised by a McKeesport dealer as first class Ford size cord tire for \$7.

The examination, as might be expected, proved that the tire was a second and a very poor one at that. Then the advertiser was called before the mayor of McKeesport and the criminal phases of the advertisement were explained.

The mayor sided with the legitimate tire dealers and for this time let the advertiser off with a warning of dire consequences if he repeated his effort to mis-advertise tires.

According to our notion this is one of the great possibilities of tire associations. There is no reason at all why honest tire men should suffer from the actions of gyps of this sort and the way to correct the poor opinion of tire dealers in general is to point out who are the real offenders who make this reputation.

The poor opinion now held of tire merchants is not deserved by the great majority, but bad gossip spreads

faster than good gossip. One man who gets a raw deal will talk many times as fast and loud as the man who gets a good deal. An honest deal is expected by a tire customer, so he is not surprised when he gets it and does not talk much. A bad deal is not expected, so he does talk.

If the Pittsburg association will keep up this work, we confidently expect that Pittsburg will soon be one of the bright spots in the tire world. We suggest that other associations take the hint from the Pittsburg case and get busy cleaning up some bad spots in their territory.



*You spend a lot of money to produce sales. How much do you spend to protect sales?*



## Unappreciated Charity

HE was the owner of one of the brightest, cleanest looking shops it was ever a motor car owner's privilege to see. He was an intelligent, well mannered man and a good mechanic, but he was going broke and he knew it. He wondered why.

The customer to whom he was talking had just received from the owner of this shop a car that had been left to have the motor overhauled. The car owner was delighted with the result, especially the bill. This man had had motors overhauled before and he knew the cost. He was something of a mechanic himself, and he had some idea of the time required. The bill he received was amazingly small. He thanked the shop owner and went away wondering how it could be done and for some time he kept an ear attuned to discover evidence of sloppy work. He was openly suspicious of the job, but his suspicions were lulled by his knowledge of the man. The job proved all right.

Today that car owner does not know the secret of the small bill. The shop owner does. He has learned that he was giving to this car owner, just as he had given to many other customers, entirely free use of \$3000 worth of equipment. Every operation on this overhaul job was done better and quicker than when this shop owner and his helpers worked without equipment. The shop owner of this equipment was proud of it and proud of the work that it turned out.

He had not learned, when buying the equipment, that he must charge for the use of it. He went in debt for the equipment and it did not bring enough money into the till to pay the interest on the debt.

Merely because the shop owner kept on selling labor at the same old price.



*That sometime prospect—File his name where it will come to your attention once in a while.*



## Need for Caution

IT is gratifying to see that dealer associations and other trade organizations are taking such an active interest in the efforts to reduce so-called automobile accidents. We believe that this is a task that confronts every branch of the industry—not only because of the great humanitarian need for such effort from men who understand automobiles and traffic—but from the viewpoint of sales

resistance and public opinion that might hurt the automobile business.

Some dealer associations have made the mistake of asking the newspapers to go light on the question of fatal automobile accidents. It is all right to ask newspapers to be fair on this question and to be a little more careful what they classify as automobile accidents, but it is only arousing a man who believes that he in a public benefactor work to ask a newspaper to ignore such accidents or to treat them more lightly than he would other similar deaths.

The serious mistake that has been made by dealer organizations is sending out publicity that tends always to put the blame on the pedestrian. This is a very serious mistake. Of course pedestrians are to blame for accidents in many cases, but we cannot as yet give a clean card to all automobile drivers. For some time to come it would appear that we must put forth an effort to reform drivers.

Those within the industry who are working on this worthy mission should be careful not to hurt their own cause by "passing the buck." Only a fair campaign can win.



*Flat rates speed up shop work.*



### Standardization

A COMPANY is being organized to promote the sale of a gasoline tank cap. The salesmanager of this company says that to start with the company will make 12 sizes and they hope to increase this number to 26 within the next few weeks. The 26 sizes and variation of thread sizes, he thinks, will care for most of the trade so far as his cap goes. He says that there will be many automobile drivers who will be deprived of the joy of using his cap because none of the 26 will fit his car and there are not enough of his kind of cars to justify this firm in making a cap for them.

Here is a job for the committee that is going to sell standardization. Just why there should be so many types of gasoline tank caps is something of a mystery. It is surely to be hoped that no designer of an automobile ever thought that he was making a sales point when he designed a gasoline tank that could not be covered if the cap was lost. It would seem that just the opposite might be a sales point; that you could get a gasoline cap wherever automobiles, maintenance or accessories were sold.

If there is anything a man wants to do when he discovers that he has lost a gasoline cap it is to get another one. Three sizes, each size with the same thread, should be ample. Then as long as a dealer had one of each on hand, the car owner could avoid the danger that lurks in an open gasoline tank. Fancy caps could be made for those who want them, but safety is the prime requisite.



*Flat rates and piece-work go hand in hand.*



### The Transportation Store

WE want to make a suggestion here that we believe is worthy of consideration by every person who is interested in the welfare of the automotive dealer. This is not a hurriedly arrived at conclusion and cannot be proven by statistics, for the statistics as relate to this

particular question have not been intelligently gathered. It is this:

The service of maintenance departments of the factories should have a lot more to say about the selection and continuance of dealers than this department now has. The successful dealer of the past and of the future, is not the man who can sell cars, so much as the man who can keep them sold. In other words, we believe that the very basis of success of the automotive dealer in his handling of the maintenance problem, the after market of the car.

The dealers as a rule think they are working for the sales department of the factory alone. Many dealers have only sales in mind, or if they think of maintenance, they think of it as a necessary evil. These men find it as easy to sell one car as another and frequently they change lines.

Now the dealer who regards the sale of a car more of an introduction to a desirable customer than as an incident of immediate profit, is the dealer who is going to make the most of his car sales. There is not a great profit in the sale of a single car at present discounts, rents, commissions and rate of sale. However if this car owner keeps coming back to this dealer for tires, for bumpers, for maintenance and such things as he will need while he owns and uses that car, then this dealer has the opportunity to make a nice and continued profit on this sale. Also he will have something tangible to tide him over when comes that year (if it ever comes) when car sales are not plentiful in his community, because people will not quit driving cars, even if they hesitate on buying them.

The man who sells transportation is the successful merchant of the future.



*When people pick up the home town newspaper do they read something about your business?*



### Associations

A MOVEMENT among associations in Illinois that is worthy of consideration is that of the association members of one city driving over to a nearby city and visiting with the association of that city. It becomes really a joint meeting of the two associations.

Fellowship is one of the big advantages of an association membership and this gives a double advantage of that nature. It also gives opportunity to decide some customer suggested disputes between the two cities. Take Peoria and Springfield, for instance. These two associations have been meeting together. There is a certain trade that lies between these two places and dealers in both cities are competing for it. It is only natural that rumors of extravagant used car bids should be bandied about and in a short time the Peoria dealers might think the Springfield dealers entirely demoralized. Or the reverse might be equally true.

If the dealers from these two cities visit each other in a friendly spirit several times, they will soon learn that each city has honorable, well meaning merchants and that listening too much to prospective customers about the wasteful methods of other dealers is not good business.

There is a great need in this industry of more confidence between dealers of the same city, of the greater trade communities and of states and of the entire country. The best interests of the dealer industry will be served by joint association meetings. May we have more of them.



# Curtail Output 20 Per Cent in July

## Reports for First Week Do Not Equal Record for June

### Caution in Ordering Materials Marks Movements of Some Manufacturers

NEW YORK, July 23—Reports received for the week of July show a 20 per cent curtailment in operating schedules of automobile manufacturers as compared with the pace followed in June. This falling off is noted on the part of two-thirds of the producers and does not refer to Ford which increased its schedules and established new daily and weekly production marks.

The week was short, a holiday entering to cut down the number of working days, and it is not likely that the same percentage of decline will prevail throughout the month. Production of cars and trucks for the month as a whole, however, will not equal the 376,000 total output reported in June, due partly to fewer working days and partly to the generally reduced schedules on which the industry is operating.

Caution is marking the movements of car manufacturers in placing commitments for material. While some of the larger producers have filed orders with parts makers covering their requirements to December, others are directing July deliveries on orders placed for August and September and are not reordering at this time.

Several factors enter into this situation. Manufacturers, who are availing themselves of the lull in operations to plan schedules for the remainder of the year, are watching closely any development that would tend toward greatly reduced sales in the fall. As in the past, production will be governed solely by demand and producers will work against warehousing of stocks or overloading dealers.

Another factor, no less important in its bearing on commitments, is the fact that this between-season period finds the average manufacturer with sufficient material on hand for use in cars now under production and hesitant to place orders for supplies to meet the needs of models in the process of development, until all changes are decided upon and operating schedules are definitely fixed.

Conditions in the retail field are satisfactory, the falling off in sales from previous high levels not being unusual to the season and indicating no pronounced diminution of buying interest. The volume of purchases is well in excess of last year.

Truck operations are proceeding along conservative lines, with a steady movement forward. City buying is being well sustained. Output of busses is greater with their more general adoption as a means of transportation.

## Million Ford Engines Made in Less Than Six Months

DETROIT, July 23—Ford Motor Co. built its 8,000,000th engine July 11, rounding out another million in six days less than six months, and is on its way to another million at the rate of about 7,000 engines daily. Engine No. 7,000,000 was built Jan. 17 of this year at which time production was averaging about 4,800 daily. The average for the latest million period was 6,711 a day for the 149 working days or about 166,670 a month.

Under the increased manufacturing schedule the company built its last million in two months less time than its seventh, eight months being required to round out this total, as the six millionth passed off the assembly line May 18, 1922. Nearly a year before that date, May 28, 1921, the five millionth engine was built. The first million mark was passed in 1915.

### GASOLINE SUBSTITUTE TESTED

WASHINGTON, July 21—A new gasoline substitute has been tested by the Government at the Anacostia Air Station, according to an announcement made this week by the Navy Department. The substitute is a synthetic compound composed of 30 per cent denatured anhydrous alcohol, and 70 per cent common gasoline. The Department claims that the substitute is cheaper in cost and yet develops the same horsepower as high grade aviation gasoline with less heat to the engine. Further tests, the department announces, will be made before definite conclusions are reached.

### TRADE HOLDS PICNIC

CHICAGO, July 23—The third annual field day and barbecue of the Chicago Automobile Trade Association will be held Thursday, July 26, at Deer Grove, a county forest preserve about 30 miles from Chicago. Athletic contests, swimming, a baseball game and an abundance of refreshments are promised. H. P. Branstetter is chairman of the entertainment committee.

### PAN MOTOR PLANT SALE

ST. CLOUD, Minn., July 21—Sale of the plant of the Pan Motor Co., valued at \$3,000,000, has been ordered by the district court. The auction will take place at 10 a. m., Aug. 1. The property will be sold in three parcels, by court order.

### ROLLS ROYCE IN SAN FRANCISCO

SAN FRANCISCO, Cal., July 20—The Rolls-Royce Company of America, Inc., has opened a factory branch in San Francisco, in the old Stutz quarters on Van Ness Avenue, near O'Farrell street, with R. B. Jackson as branch manager.

## Reeves Confident of Record Year Despite Seasonal Lull

### Brisk Buying in Southern Sections as Well as in Rural Districts

NEW YORK, July 23—Although orders are still pouring in on the car manufacturers, it is apparent that the usual seasonal decline is here, but not to so great an extent as in previous years, reports Alfred Reeves, general manager of the National Automobile Chamber of Commerce. Reeves has just returned from the monthly meeting of the directors of the N. A. C. C. at Buffalo, following which he visited the big plants in Detroit, Flint and Lansing. Reeves says the feeling is that there will be a slowing down for the next two months, but that the year itself, taken as a whole, will be the best in the history of the industry.

"I was told that there is a surprising amount of buying among the farmers, despite the low price of wheat," said Reeves. "Southern business is brisk, helped by cotton, while all dealers are decidedly optimistic. There are a few cases of slow movement on the part of open cars, but I believe they all will be cleared out in a couple of months. The demand for closed cars, of course, more than keeps up with production. I find, too, that the manufacturers are decidedly conservative in their every move. Inventories are being watched and the makers are keeping their fingers on the public pulse.

"There is a feeling in the trade that the world at large has been well sold on the motor car and that mass salesmanship has produced results. By that I mean that a dealer, finding he cannot sell his prospect his own particular make urges that he buy some other—anything to get him to buy some automobile on the theory that once sold he always will want a motor car.

"Our big problems are first, the reduction in the number of accidents which can come by education; second, the relief of congestion of traffic which is so bad in cities over 100,000; third, watchfulness against overtaxation and, fourth, highways, more of them, better ones and the honest expenditure of funds appropriated for highways."

### TIMKEN CORRECTS STATEMENT

CANTON, O., July 23—The Timken steel from which Timken bearings are made has a carbon content of from .15 to .20 instead of a carbon content of .29, as was stated in a recently published Timken roller bearing advertisement.

Because of the extreme interest manifested in this exposition the company desires that the fact be known that it was because of a typographical error that the figure .29 was used.

# Prepare Now for Christmas—A. E. A.

## Rolls-Royce, Three Years in America, Reviews Progress

### Production for This Year Is Expected to Be Between 500 and 600 Cars

SPRINGFIELD, Mass., July 24—The third year of the manufacture of Rolls-Royce automobiles in America was completed this month and was fittingly celebrated by Rolls-Royce of America, Inc., whose general offices and factory are here. The original Rolls-Royce works are at Derby, England.

Progress of the company since its establishment in the United States was reviewed by S. deB. Keim, general sales manager. Production of the company this year is expected to be between 500 and 600 cars, the present rate being about 11 complete vehicles each week. The company has its own coach works division where 11 different body designs are produced.

Distribution is through five direct works branches, at New York, Boston, Chicago, Cleveland and San Francisco; 15 sales representatives in various cities, and two branch sales offices, at Hartford, Conn., and Troy, N. Y., under the direction of the general sales office. This gives 22 points of contact, all having adequate service facilities.

## Dealer Acquires Control of Milburn Wagon Co.'s Business

TOLEDO, O., July 21—J. A. Kellam, who has for some time been the local dealer for the Milburn electrics, has acquired controlling interest in the electric passenger car business of the Milburn Wagon Co., it was announced here this week.

He will handle the entire distribution of cars in both the domestic and foreign fields. There are more than 150 dealers in this country and many foreign distributors who will come under Kellam's direction.

H. W. Suydam, president of the company, who is soon to return from his trip abroad, will continue to head the factory service department. It is the intention of the company to continue its service which has become a matter of pride in connection with the production of its cars.

The old Milburn plant was sold a few months ago to the Buick Manufacturing Co., of the General Motors Corporation, but the operations of the plant on Grand Avenue here will continue as formerly under the new plan.

### FIRST VICTOR TRUCK

ST. LOUIS, July 21—Production of the first Victor Truck by the new company headed by Guy Wilson was celebrated last week by officials of the company with a trip to a country club.

The first truck was a speed model with a capacity of 1500 to 2500 pounds to be sold for \$1200. The name selected for it is "Lightnin." The wheelbase is 131 inches and was designed by Sherman H. Dorsey, vice president and chief engineer of Victor Motors, Inc.

## Studebaker Sells 81,800 Cars in First Six Months

SOUTH BEND, Ind., July 21—Sales for the first six months totaled 81,800 cars, is the announcement made by the Studebaker Corp. This is an increase of 36 per cent over the best previous six months' business in Studebaker history—that of early 1922—when a total of 60,053 was sold. Compared with sales for the entire year of 1918, the half-year record of 1923 shows an increase of 243 per cent. It is 108 per cent greater than sales for the full twelve months of 1919. It exceeds the sales for the full year 1920 by 59 per cent and is 23 per cent greater than the sales for the complete year of 1921.

### WILSON SUCCEEDS TWYMAN

KENOSHA, Wis., July 20—James T. Wilson, vice-president and assistant manager of The Nash Motor Co., for many years associated with C. W. Nash, has taken over the management of the company's four cylinder car division, following the resignation of B. W. Twyman. Ever since the organization of Nash Motors, Wilson has been assistant manager and for the past three years he has been a vice-president of the company. Although Wilson now will devote most of his time to the Nash Four he will continue also to direct production at the company's six cylinder car plant in Kenosha.

### ATLANTA DEALERS' PICNIC

ATLANTA, Ga., July 21—The Atlanta Automobile Association will have its annual outing and picnic at the Brookhaven Country Club, near Atlanta, July 26, and practically the whole automotive industry of the city will shut down during the day to attend. During the morning the annual contest for the 18-hole golf championship of the association will be held, and entertainment has been arranged for the dealers throughout the day.

### BUYS GOLD PLATED CAR

CHICAGO, July 18—The gold plated McFarlan car, which was bought from the factory by Harris & Rodgers, Chicago automobile dealers, and exhibited at the National Automobile Show last winter, has been sold by Mark C. Hann, sales manager for Harris & Rodgers. The price was \$25,000.

The purchaser was a woman from Oklahoma City whose family acquired wealth from oil. The transaction was for cash.

## Gives Schedule of Holiday Activities for Dealers

### An Early Start Will Go Long Way Toward Successful Campaign, Says Mogge

CHICAGO, July 23—Christmas sales talk in July is put forth by the merchandising department of the Automotive Equipment Association in the effort to start automotive dealers on the way to a large business and handsome profits at the holiday season.

"Make preparations now to capitalize on the idea of automotive gifts for Christmas," is the advice of Manager Mogge in his latest bulletin to salesmen of the jobbers and manufacturers connected with the A. E. A. "An early start will go a long way toward insuring a successful campaign for all," says the bulletin.

A schedule of activities for automotive merchants who wish to make the best of this Christmas business is outlined as follows:

1. Arrange to see the A. E. A. film, "An Automotive Christmas."
2. Sell executives and salesmen of own organization on potential market.
3. Place orders with jobbers for Christmas requirements. This should include accessories, parts, supplies, and also shop equipment so that it will be profitable to push "service card" idea.
4. Purchase Christmas wrapping materials to take care of any items not put in Christmas packages by manufacturers or jobbers.
5. Read all A. E. A. literature.
6. Begin distribution of literature on Nov. 1.
7. Start sending out letters to trade about Nov. 15.
8. Put in Christmas windows, starting Dec. 1.
9. Display Christmas goods, starting Dec. 1.
10. Start advertising in newspapers on Dec. 7.
11. Run picture slide ads starting Dec. 1.
12. SHOW 'EM WHY AND ASK 'EM TO BUY AUTOMOTIVE GIFTS FOR CHRISTMAS.

### FRANKLIN 21ST ANNIVERSARY CLUB

SYRACUSE, N. Y., July 21—A Twenty-first Anniversary Club is being formed among Franklin dealers in recognition of the sale 21 years ago this month of the first Franklin. Membership in the club is limited to dealers whose orders from Franklin owners reach a certain total in July. The dealer in each of eight groups who books the highest percentage of orders in excess of allotment will have the title of grand master and the dealer with the highest percentage in the entire eight groups will be called the Grand Imperial Master.



## Motion Pictures Used in Careful Driving Campaign

### Film Entitled "The Legion of Sane Drivers" Shows How Caution Aids Safety

CHICAGO, July 21—The Chicago Motor Club will sponsor in Chicago the exhibition of the moving picture, "The Legion of Sane Drivers." This picture was made at the suggestion of Mayor William E. Dever in cooperation with representatives of the National Safety Council.

The picture is rather localized to Chicago, as it was made on the streets of this city under direction of traffic policemen, but it has many fundamental scenes as to good driving and with some alterations could be made into a constructive film of general interest. The scenes do not feature accidents as things to be overcome and in no scene is the threatened accident carried to the injury stage.

Always the accident is averted by sane driving and the reliable mechanism of the car. Only one wreck scene is used and that is to illustrate a story told by a driver who refuses a drink from a fellow passenger and who tells what once happened to him. The picture of this wreck indicates it was of a rather conservative sort.

The picture was first exhibited at the annual convention of the Motion Picture Theater Owners of America at their recent convention in Chicago and was approved by the theater owners as a good character of picture of this sort. Support for the distribution of the picture has been promised. A safety campaign was recently staged at Aurora, Ill., with this picture as a chief argument. It was favorably received.

The Chicago Motor Club anticipates favorable reception of the picture by the theater owners of Chicago. The industry probably will approve the picture in that it features correction rather than accidents. The film was produced by the Atlas Educational Film Co. of Oak Park, Ill.

### BANK DRAFT VS. CASH

MIDDLETOWN, O., July 21—The appearance of respectability and high standing in the community enabled a man pretending to be a minister to defraud C. E. McCune, Middletown automobile dealer, with a worthless bank draft for \$2000. In return for the draft the dealer gave an automobile priced at \$1965.50 and the balance in cash. And now the buyer is gone with the car.

The swindler pretended to be a Baptist minister and actually was employed as pastor of a church at Franklin, O. several weeks in advance, saying he expected to receive an increase in salary extras for him and on July 1 he tendered and a substantial sum through a bank. The draft and took the car, a Chandler. The car was ordered and equipped with He made arrangements to buy the car chummy sedan. The man went by the name of F. W. Gordon and McCune has

since learned that he practiced a similar swindle on dealers in Texas, Colorado, Kentucky and Ohio. He is described as 5 feet 7 inches tall, weighing about 145 pounds, with dark complexion and a scar on left side of neck.

## Aggressive President of Birmingham Association



W. STERLING EDWARDS, JR.

*President of Birmingham Motor Trades Association, which recently adopted a comprehensive plan of activity for the next year. Mr. Edwards is head of the Edwards Motor Co., Chevrolet dealer.*

### TRIANGLE TRUCK REORGANIZED

DETROIT, July 20—Three new officers and five new directors have been elected by Triangle Motor Truck Co. of St. Johns, Mich., and the company is preparing to extend the manufacture and sale of its vehicles. The company will have \$100,000 in new money through the sale of new stock within the company, authority for which was recently granted by the Michigan Securities Commission.

The new officers are H. D. Minich, president and general manager; B. F. Wright, vice president in charge of engineering and manufacturing, and W. L. Bettler, Jr., secretary and treasurer. Each of these men was associated with the former Republic Motor Truck Co. of Alma.

The new directors include the officers and M. W. Malseed and W. C. Searl. Former directors who continue are F. C. Burk, Eugene Hart, E. E. Emmons and C. S. Clark.

### 10,147 JORDANS IN A YEAR

CLEVELAND, July 20—Production of 10,147 cars in the 12 months ending June 30, was the record of the Jordan Motor Car Co., according to an announcement by the company. This was an increase of 93 per cent over the production for the preceding 12 months. Total sales volume was \$15,029,456.71.

## "Protective Association" Fails to Explain Objects

### Peoria Dealers' Secretary Unable to Get Satisfactory Information About Enterprise

PEORIA, Ill., July 23—Members of the Peoria Automobile Dealers' and Accessories Association who had received inquiries from the National Automobile Dealers' Protective Association for financial information regarding their own and other dealers' business, asked F. C. Zillman, manager of the Peoria association, to investigate this National Protective Association.

Zillman wrote a letter of inquiry to the Protective association at its headquarters, Lock Box 63, at Troy, N. Y.

He asked the association the following questions:

1. Who is the National Automobile Dealers' Protective Association?
2. Who are its officers and directors?
3. Are they automobile dealers?
4. In what way do you attempt, by concerted action, to remedy existing trade evils?
5. By what methods do you propose putting the retailing of automobiles on a sound basis?
6. What do you do with the information acquired through your questionnaire?

Receiving no reply to this letter, Zillman wrote to the protective association again, giving one week for a reply, saying that at the expiration of this time he proposed issuing to his membership a bulletin concerning the Troy organization.

Before the week had elapsed, Zillman received a reply from a Troy attorney who said, "I am at a loss to comprehend the reason for your inquiries" and went on to ask what use Zillman expected to make of the information if supplied to him. The attorney said he represented the Protective association.

Zillman replied to this letter by stating that it was his belief that members of the Peoria Association had a right to know the responsibility of persons asking for confidential information concerning its members.

None of the questions asked by Zillman was answered by any representative of the Troy organization and he received no reply except that from the attorney.

Zillman had in the meantime made inquiries concerning the Troy organization and he informed his members that to the best of his knowledge this so-called Protective association was engaged in gathering information regarding automobile dealers in order to obtain lists to sell to manufacturing firms who wanted to conduct a direct mail campaign to automotive dealers.

Apparently the Troy organization is not an association at all, as that word is commonly used today. No representation that this association "protects" dealers is made.

## U. S. Files Antimonopoly Suit Against 10 Bumper Makers

### Alleges That Through Control of Patents American Chain Co. and Others Have Restrained Trade

NEW YORK, July 23—A bill in equity filed in the Federal Court by Special United States Attorneys David A. L'Esperance and R. W. Joyce asks for an injunction restraining the American Chain Co. and 10 other manufacturers of loop-end spring bar bumpers from "continuing methods threatening to result in a monopoly of the entire trade in automobile bumpers in the United States." It is expected the defendants will answer within 20 days and the case come up for hearing some time next winter.

The Government names, in addition to the American Chain Co., 10 other manufacturing concerns which are alleged to be licensees of the American Chain Co., under the bumper patents issued to Rolfe B. Fageol, Thomas A. Hoover and William J. Pancoast and William J. Grotenhuis, as follows: Gemco Manufacturing Co., Milwaukee; L. P. Halladay Co., Decatur, Ill.; Biflex Products Co., Waukegan, Ill.; Allith-Prouty Co., Danville, Ill.; Wolverine Bumper & Specialty Co., Grand Rapids; New Era Spring & Specialty Co., Grand Rapids; American Metal Parts Manufacturing Co., Milwaukee; Bellevue Manufacturing Co., Bellevue, O.; C. G. Spring Co., Kalamazoo, Mich., and the Bilt-Right Products Co., Danville, O.

It is contended that the American Chain Co., controlling the Fageol, Hoover and Pancoast-Grotenhuis patents, has licensed the ten concerns named above to manufacture loop-end spring bar bumpers as defined by these patents on a royalty basis and that the agreement entered into with each licensee calls for maintaining uniform prices, minimum gross sale price and uniform trade discounts and cash discounts along with the fixed resale price. It also is claimed that the agreement stipulates that the licensor and the licensee shall fix a minimum profit for themselves of not less than 10 per cent more than the cost of producing and marketing the bumpers.

The Government claims that this alleged conspiracy in restraint of trade was commenced prior to Jan. 1, 1920, and that it is contrary to the Act of Congress of July 2, 1890, entitled "An Act to Protect Trade and Commerce Against Unlawful Restraints and Monopolies." It is charged that through the American Chain Co. gaining control of patents numbered 1,202,690, 1,191,306 and 1,374,893, it can control at least 60 per cent of the trade and that if it is successful in the litigation now going on it will control the entire trade, amounting to more than \$20,000,000 a year.

Accompanying the bill and in the nature of an exhibit is a copy of the agreement said to have been entered into with the Gemco Manufacturing Co., which is declared to be similar to those entered into with the nine others named.

Following the filing of the suit, Walter B. Lashar, president of the American Chain Co., issued the following statement:

"The government suit will not only clarify our own right but the rights of other patentees. Anybody can make automobile bumpers, but we have patents covering a particular kind of spring bar bumper, and if we attained a monopoly, as feared by the government, it would be only because automobilists prefer this kind of bumper to all others. Clarification of the whole situation is necessary.

"The American Chain Co., Inc., originally acquired for its own use several patents covering spring bar bumpers and has since licensed eleven other manufacturers to produce these bumpers. The nature of the licenses issued by the Chain company has been well known in the trade and to the government practically since the license policy was adopted and their terms are such as to safeguard the quality of all bumpers produced.

"The American Chain Co. enjoys, in fact, no monopoly of manufacture and only the monopoly of sale which is brought about by the preference of the public for this kind of bumper. The question at issue concerns the rights of a patentee to produce his own patented article and to license others to produce the same under restrictions designed to insure quality. There could be no question in the mind of the government as to the right of the American Chain Co. to produce its own patented article, which would be a legal monopoly in fact, and the present suit has arisen because others were licensed to produce under the American Chain patents."

## Los Angeles Service Managers Try to Solve Their Problems

### Form Organization of Their Own Within the Motor Car Dealers' Association

LOS ANGELES, July 23—Service managers employed by members of the Motor Car Dealers' Association recently formed an organization for the purpose of analyzing mutual problems and endeavoring to bring about a relief. Members of the organization have reported a very pronounced shortage of capable automotive mechanics, and means to bring about a relief now are under discussion.

Return to the days of apprentices and adaptation of the old trade principle to the automotive business is being advocated. It is claimed that youth schooled in shop practices, where they have an opportunity to learn practical phases of the work, make better mechanics than those who are graduated as qualified by the automotive schools. Inasmuch as there are very good automotive schools in Los Angeles, this declaration by the service managers is somewhat surprising, but there is practically unanimous opinion on the subject.

The service managers who have had experience with the flat rate system declare it is a success. It is maintained there is less trouble with customers in shops using the flat rate system than others. The manager for one of the largest passenger car dealers in the city says the flat rate has been the salvation of their organization by developing the repair department into a profitable part of the business, although for years previous it had been operated at a loss. Complaints on the part of customers are said to have been reduced to a minimum.

The service managers have made the allegation that the sales departments, by making embarrassing promises impossible to fulfill, are the cause of a great deal of their grief. It is charged that salesmen, in their endeavor to placate customers, put responsibilities on the service departments that properly do not belong there. Their solution for this difficulty is said to lie in closer co-operation and refusal by the sales department to make promises that cannot be kept by the service managers.

### SHOW ROADS TO LAW MAKERS

ATLANTA, Ga., July 24—With the co-operation of the members of the Atlanta Automobile Association 200 members of the Georgia General Assembly made an all-day trip last week into sections of North Georgia for the purpose of inspecting the new roads that have been built in that section, and with a view to considering extensive appropriations for a good roads system throughout the state during the present sessions of the legislative body. Atlanta dealers furnished more than 40 automobiles for the trip, about 25 of the dealers accompanying the legislators.

## 2-Cent Gasoline Tax Yields \$317,959 in Month

INDIANAPOLIS, July 21—The Indiana state two-cent gasoline tax brought \$317,959.04 into the state treasury in June, the first month in which the law was in effect. While June is a normal big consumption month, Robert Bracken, state auditor, believes the first month's collection will be found to be a fair monthly average for the year. The June tax returns are supposed to have been reduced somewhat from normal because many had bought large supplies before the tax went into effect. On this basis the tax will yield between \$3,000,000 and \$4,000,000 annually for highway construction.

The cost of collecting the June installment was but \$375, or about one-tenth of one per cent of the amount collected. When the law was under consideration by the legislature the strongest attacks against it were that the cost of collection would eat up a large amount of the funds. Collection is being made from wholesalers by agreement, and to date but one large oil company has filed objections to the law.



## Wants Rebate When 1910 Model's Carbureter Gives Out

DETROIT, July 21—Hupp Motor Car Corp. reports an owner of a 1910 model enclosing an order for a new carbureter and pointing out that he believed himself entitled to a rebate on the one that had always been on the car, adding that it seemed to have worn out considerably sooner than the car's other parts needed replacing. His car at that time had run 165,000 miles.

Service orders indicate, the company said, that many of the 1618 cars built by it in 1909 are still in use.

## 15 Automotive Associations in Trade Organization List

WASHINGTON, July 21—A compilation of trade associations in the United States, just completed by the U. S. Department of Commerce, shows a total of 1304, of which number 15 of national scope are devoted to the automotive industry and four to the aeronautics industry.

The list of each, as announced by the Department, is as follows: Automotive, Automobile Accessories Branch of National Hardware Assn. of the U. S.; Automobile Body Builders' Assn.; Automotive Equipment Assn.; Automotive Manufacturers' Assn.; Automotive Wood Wheel Mfrs. Assn.; Automotive Metal Wheel Association; Cycle Parts and Accessories Assn.; Motor and Accessory Mfrs. Assn.; Motor Truck Assn. of America, Inc.; Motorcycle and Allied Trades Assn.; National Assn. of Automobile Show and Assn. Mgrs.; Nat. Automobile Chamber of Commerce; National Automobile Dealers' Assn.; National Cycle Dealers' Assn., and Tire and Rim Assn.

The aeronautical associations are: Aeronautical Chamber of Commerce of America; Manufacturers' Aircraft Association, Inc.; National Aeronautic Association of the United States of America, and the World's Record of Aeronautical Commissioners, Inc.

## WASHINGTON DEALERS' PICNIC

WASHINGTON, July 21—The Washington Automotive Trade Association held its annual outing at Morgantown, Md., July 12. More than 60 members participated in the affair which was replete with athletic stunts of various kinds, ending with an old-fashioned barbecue on the estate of Robert Crain, who endowed the Crain million dollar highway in Maryland. Winners in the athletic contest were: Shot put, E. F. Ver Wiebe; monkey race, F. S. Absher; broad jump, W. D. Lockwood; and three-legged race, C. T. Lindsey and J. D. Dennison.

Rudolph Jose, Cadillac distributor, and donor of a handsome silver cup to the member winning the highest number of points, acted as referee. The cup was won by W. D. Lockwood.

## Doble Says First Model Car Will Be on Display Aug. 30

SAN FRANCISCO, Calif., July 21—The first model of the Doble Simplex steam car, to retail at \$2000, f.o.b. San Francisco, will be on exhibition in the cities around San Francisco Bay by the end of August, according to announcement by the Doble Steam Motors Corporation here. The general design of the new car follows that of the De Luxe, the \$7,000 steamer now being made by this company. The power plant is a four-cylinder, single-acting, poppet-valve, single-expansion engine, developing 40 horsepower. The cylinders are of three-inch bore and stroke, and a propeller shaft connects the driving wheels with the engine. All engine bearings are lubricated with new oil, thus eliminating draining of the crank case at frequent intervals. The power plant is located forward, immediately in the rear of the steam generator, which except for size, is the same as that in the larger De Luxe model, and under the foot board. The car is equipped with Timken axles and Gemmer steering gears. The wheel base is 124 inches and the tires are 32x4½ inch.

The Lundgren Construction Company, of San Francisco, which recently built the Standard Oil and Matson Navigation Company buildings in San Francisco, started pouring concrete in the new Doble Motors plant in Emeryville, a suburb of Oakland, on July 9. According to Earl Markwart, construction engineer for the Lundgren company, the building, which is the first unit of the \$900,000 plant, will be completed by November 1, 1923. Both the De Luxe and Simplex models are to be built at this plant, and the first car is expected to be ready for delivery by December 15, this year.

## WELL KNOWN DEALER DIES

BUFFALO, N. Y., July 21—Arthur L. Dixon, head of the Buffalo Haynes distributing agency, Main and North streets, died recently, following an operation for intestinal trouble. He did not rally from the effects of the operation.

Mr. Dixon, one of the best known distributors of this section of the state, returned a few days before his death, from Kokomo, Ind., where he had been visiting the Haynes factory. He was born in Clio, Michigan, and was 42 years old.

## DEALERS HOLD SUMMER MEETING

ADRIAN, Ill., July 21—The Hancock County Auto Dealers' Association held a large and interesting summer meeting recently in the Methodist church rooms here. The Adrian unit of the home bureau served the dinner and local members exchanged trade views and opinions.

## NEW FORD RECORD

DETROIT, July 21—Ford Motor Co. made a new production record for the week ending July 17 when 40,803 cars and trucks were produced, 428 more than the previous week's record. For the same week 1131 tractors and 206 Lincolns were made.

## City Spends Million for Automobiles in 6 Months

DAVENPORT, Ia., July 21—Citizens of Davenport in the last six months have spent \$1,032,000 for automobiles, according to the president of one of the largest banks in the city, handling dealers' financial paper. The actual sales in the period were 1,376 and the average price was \$750. There were 689 Fords sold, several \$2,500 cars, seven \$4,000, one \$5,000 and one \$3,000 car.

## 70 Per Cent of Sales at Moline, Ill., on Time Plan

MOLINE, Ill., July 21—The fiscal year ending with August, 1923, will be a record breaking one for automobile sales in this territory, dealers declare, explaining that no year since the World war has witnessed such an increase in car sales. Since last August, 1,520 cars of all models have been sold, and in June the sales reached 300. Sixty-four per cent of the year's sales have been of the lighter cars. Seventy per cent of the sales are "on time" and the remaining 30 per cent are practically in the large car class, made up of people with ready money. The small car sales at this time are nearly 50 per cent greater than a year ago. Touring cars are in demand at this particular time but for the remainder of the season the closed car finds a ready market and on the year-round business probably leads the touring models.

Ford agencies report sales to date equal almost to the total sales for 1921, and report a disposal of 500 cars here; Chevrolet, from Aug. 1, 1922, has sold 500; Buick in the same period, 107. In the larger car class, the Velie leads with 159; Gardner, 58; Stephens, 50 since January 1. Every agency in the county has been oversold at all times, the survey indicates.

## TO GIVE CREDIT INFORMATION

WASHINGTON, July 21—A system of exchanging credit information on automobile owners will be devised by the Washington Tire and Accessory Dealers' Association, it has been decided by that organization, which this week held its last pre-fall meeting. It was decided that no meetings would be held in July and August and that the association at its September meeting would work out a system whereby credit can be extended under certain conditions to car owners who have a good credit record.

Beginning in September a drive for membership will be inaugurated and it is expected that by Oct. 15 every reliable dealer in Washington will be enrolled as a member. Another cooperative measure was decided upon in that the members will establish a clearing house for odd sized tires and slow moving accessories.

## Hundreds of Dealers Attend Denver's Pageant of Progress Replete With Automotive Features

Exhibit of Cars Under Large Tent Attracts Visitors From Surrounding Country—Old Cars Seen in Odd Race

DENVER, July 21—Automotive activities were among the most popular events of the Colorado Pageant of Progress, which just closed a two weeks' program at Overland Park, already famed as a public camping ground for motorists. The Denver Automobile Dealers' Association maintained a tent-covered automobile show throughout the pageant, with individual members featuring the show in their regular advertising and with the association itself running full-page advertisements in the Denver newspapers at the beginning of the second week.

There were automobile races, tractor races, fancy driving contests, old-car races, United States Forest Service highway exhibits, automobile polo games and other motor attractions, both educational and entertaining. In fact, the automotive industry is given credit for having proven itself a mighty big factor toward the success of the entire pageant.

In the show itself, elaborate exhibits were staged by the Ford, Lincoln, Chevrolet and Buick firms. The Ford people made the show a lively enterprise for the benefit of both dealers and the general public. Out of 175 Ford dealers in the territory supplied by the Denver branch, for example, 125 attended the show. Many of these also brought goodly delegations along from their respective communities. At Loveland, Colo., the dealer succeeded in arousing enough interest to organize a substantial party of citizens to make the trip in a body, accompanied by the Loveland Boys' Band. Dealers came from throughout Colorado and also from several points in Wyoming and New Mexico. Some Sioux Indians, who were a part of the entertainment program of the pageant, were shown how to drive cars and tractors, while Indians, cowboys and heaps of more "dignified" citizens enjoyed riding on the special

train pulled by a Fordson tractor. The Chevrolet Band of St. Louis was also a lively and popular addition to the regular pageant attractions.

Although neither the Chevrolet branch nor the MacFarland Auto Co., Buick distributor, made any special effort to persuade their outside dealers to attend the show (inasmuch as both organizations will have their regular dealer conventions in Denver in the next few weeks), both these lines were well represented in dealer attendance from nearby towns. These and other exhibitors also report a goodly number of direct sales at the show and a fair listing of prospects. It was far more difficult to separate the serious visitors from the curious and fun-seeking and to line up prospective buyers than it is at a regulation automotive show. But it was considered well worth while as a summer show, and was especially pleasing to dealers exhibiting motor camping equipment and similar accessories.

As an exciting automotive opener for the pageant, a sixty-three-mile road race from Denver to Castle Rock and return was staged by the Rocky Mountain News and Denver Times. Twenty-three drivers started in this event, which was won by Joseph McGregor in a Wills-Sainte Claire in 1:04:32.

Other speed thrills were provided on the park's one-mile dirt track by Sig Haugdahl and other professionals in exhibition races, while two races for "pioneer" cars only furnished as much genuine fun as any entertainment feature on the program. The "old boys" in these two races were a one-cylinder Cadillac, one-cylinder Oldsmobile, two-cylinder Buick and six-cylinder Ford. The Ford won the first event of two miles in 6:14, while the Buick took the second on a heavy track in 8:17.

## Don C. McCord President of Apperson Under New Regime

N. H. Van Sicklen Remains as General Manager—Larger Production Planned

KOKOMO, Ind., July 21—Don C. McCord and Maurice Rothschild, New York capitalists, who have purchased a majority of the common stock of the Apperson Brothers Automobile Co., were added to the firm's board of directors at a meeting here Thursday. McCord was elected president. Other officers are: First vice president and general manager, N. H. Van Sicklen; second vice president, Edgar L. Apperson; third vice president, B. C. Buxton.

The executive committee is composed of McCord, Rothschild and Van Sicklen. It was announced following the meeting that steps will be taken immediately to increase production and intensify sales activity.

The change in Apperson ownership follows the refinancing of the company last winter, the stock purchased by the New York capitalists being that which at that time acquired by Chicago brokers. Sale of a \$700,000 bond issue to provide new working capital was undertaken last winter. In May the company announced that the bonds had been sold, a large amount having been taken by creditors, and that three year debenture notes for \$383,000 in addition had been sold, providing \$1,083,000 of new capital. At the same time Van Sicklen succeeded E. L. Apperson as president, Apperson becoming chairman of the board. This was said to have been the first time the Apperson company had interested outside capital.

McCord and Rothschild are widely interested in other automotive concerns, among them being Republic Truck and Standard Eight automobile.

## 100 DODGE DEALERS MEET

ATLANTA, Ga., July 21—Nearly 100 Dodge Brothers dealers from Georgia, Florida and part of Tennessee attended the annual meeting of the dealers held in Atlanta, July 18 and 19, at which time contracts for the coming year were renewed and merchandising plans for the rest of 1923 thoroughly discussed. Dealers in attendance, all of whom were direct dealers and distributors appointed by the factory, agreed that Dodge Brothers sales the first six months of the year were approximately 25 to 30 per cent better than the first six months of 1922.

## NO LET UP, SAYS REO

DETROIT, July 23—No let up in present business is anticipated by Reo Motor Car Co. throughout the summer or fall, and manufacturing schedules now laid out are for capacity operation through this period. Farm business is at high point at the present time and is expected to continue good both in cars and speed wagons.

## PLAN M. A. M. A. CONVENTION

NEW YORK, July 21—Two committees have been appointed by General Manager M. L. Heminway of the Motor and Accessory Manufacturers' Association to work on plans for the fall convention which will be held at Boston Sept. 19-22. The Boston committee on arrangements consists of F. T. Moore, district manager of the B. F. Goodrich Rubber Co., chairman; J. P. Hach, traffic manager of the L. C. Chase Co.; T. H. Dumper, treasurer of the F. S. Carr Co.; H. K. Johnson, F. S. Carr Co.; W. N. Lorenz, Boston manager of the Willard Storage Battery Co., and E. J. Moses of the Gray & Davis Co.

The general program committee is made up of J. M. McComb, vice president

of the Crucible Steel Co. of America; Maurice Switzer, vice president of the Kelly-Springfield Tire Co.; S. W. Dorman, vice president and general manager of the Overseas Motor Service Corp.; E. P. Chalfant, chairman of the Gill Manufacturing Co.; P. C. Gunion, advertising manager of the Hyatt Roller Bearing Co.; B. M. Asch, president of Asch & Co.; H. W. Angevine, treasurer of the Hyatt Roller Bearing Co.; A. Pauli, credit manager of S. K. F. Industries; M. L. Heminway, general manager of the Motor and Accessory Manufacturers' Association; C. A. Burrell, manager of the credit department of the M. & M. A.; H. Duester, manager of the traffic department of the M. & M. A., and M. Lincoln Schuster, manager of the educational department.



## Automotive Industry Has Bright Future in Canada

### Canadian Bank of Commerce Cites Figures Showing Its Rapid Growth

WASHINGTON, July 21—A bright future for the automotive industry in Canada is predicted in the July survey of the Canadian Bank of Commerce, citing figures tending to show that the automobile industry in Canada at the present time is one of the most active in the country. The only "drug" in the trade is the distribution of used cars which are reported as being difficult to sell.

Some dealers in cars whose business is very extensive have not been able to realize, without loss, on old cars taken in part payment for new ones, the survey points out. This condition, however, has not yet seriously affected the sale of new cars.

Figures for the fiscal years of 1921-1923 inclusive, show that the automobile exports for the year ending June, 1921, totaled \$18,241,446; exports for year ending June 30, 1922, totaled \$9,184,257; and exports for year ending June, 1923, totaled \$29,405,965.

Imports of automotive products into Canada during the fiscal year 1921, totaled \$23,738,842; imports for the fiscal year 1922, amounted to \$21,250,918; and imports for the fiscal year 1923, totaled \$27,881,144.

According to official returns, the number of automobiles manufactured in Canada during 1922 exceeded all previous records and reached a total of 101,007 cars, or 7 per cent more than the record figure of 1920, and 53 per cent more than the output for 1921. The total value of the output in 1922 was \$81,956,429.

Statistics of the automobile manufac-

turing industry show that in Canada in 1917 there were 11 manufacturing companies employing 6000 men; in 1918, 10 plants with 5363 employees; in 1919, 11 plants with 6771 employees; in 1921, 17 manufacturing plants employing 8281 workers; in 1921, 14 establishments with 5475 employees; and in 1922, 15 plants with 7344 workers.

The figures cover passenger and truck manufacturing concerns.

## Washington and Maryland Lead in Federal Road Work

WASHINGTON, July 21—The States of Maryland and Washington take the lead over all other states in keeping pace with Federal road aid appropriations for 1921, 1922, 1923 and 1924, according to compilation of the United States Bureau of Public Roads, which will be incorporated in the Federal highway bureau's annual report.

There are three achievements in which the states are rated—agreements and contracts for Federal aid executed; contracts under construction, including projects completed; and projects contemplated. Washington and Maryland show practically the same highway road improvements.

### DEALERS FROM 3 STATES MEET

ASHEVILLE, N. C., July 23—Between 200 and 300 Ford dealers of North and South Carolina and Virginia held a two-day convention here last week. They were assured by a representative of the Ford Motor Co. that an assembly plant with a capacity of 300 cars a day would be erected at Charlotte if the company succeeds in getting a reduction in commodity freight rates to apply on automobile parts.

The convention closed with a banquet at the Kenilworth Inn, at which Manager Marvel was host. Entertainment closed the program.

## Registrations of New Cars Fall Off in New York District

### 10,513 Licensed in June as Compared With 12,279 in Preceding Month

NEW YORK, July 21—Decline in the registrations of new passenger cars in the metropolitan district for June is noted in the monthly sales analysis compiled by Sherlock & Arnold. Registrations of low and medium priced cars fell from 11,287 in May to 9782 in June and of those of higher priced models dropped from the May figure of 992 to 731. Total registrations for the month were 10,513 as against 12,279 in May of 1923, and 9068 in June of last year.

For the first six months registrations of all new cars aggregate 50,289 as against 39,570 for the corresponding period last year and 24,577 in 1921.

There are five cars that are leaders in the low and medium priced field with six others above the 1000 mark for the six months period.

Two cars in the higher priced class are leaders, with sales in excess of 1000. Six others showed registrations greater than 100.

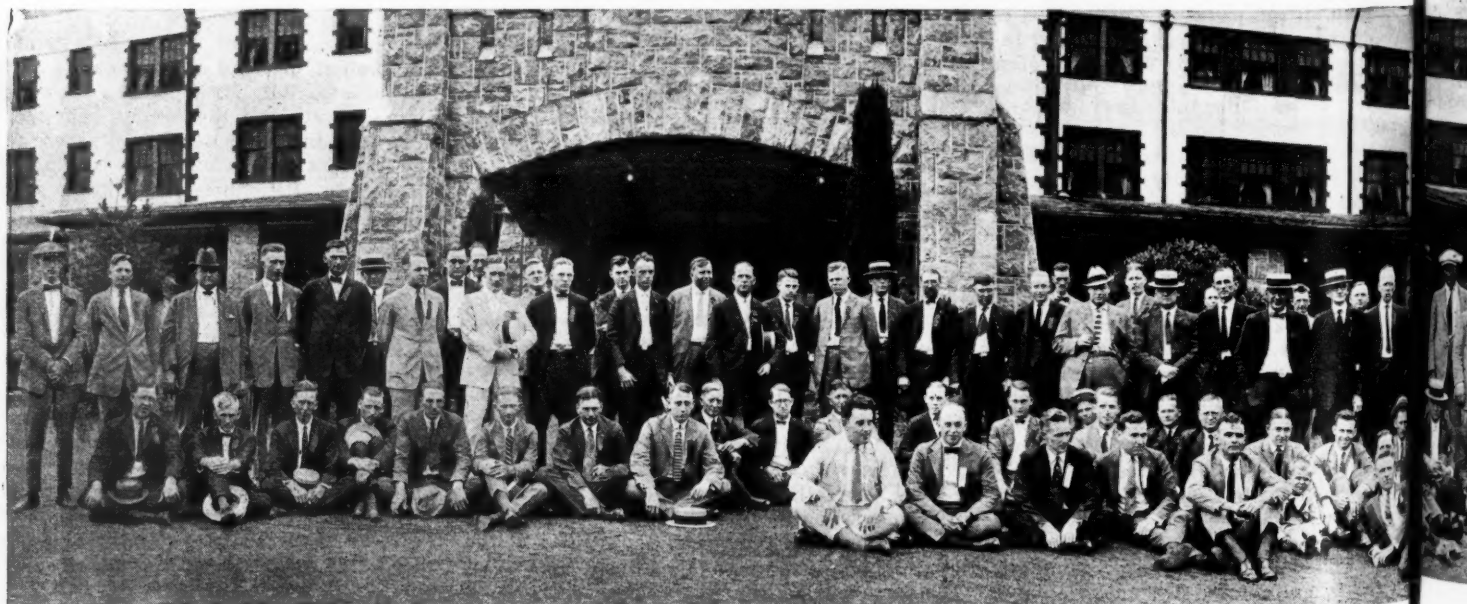
A recapitulation for the six months follows:

	Medium and Low Priced	High Priced
January .....	2,814	201
February .....	2,801	580
March .....	8,102	769
April .....	11,124	1106
May .....	11,287	992
June .....	9,782	731
Total .....	45,910	4379

### GASOLINE REDUCED ONE CENT

TOLEDO, O., July 20—Retail price of gasoline was dropped one cent a gallon by the Standard Oil Co., here this week. Station price is now 22 cents.

## Ford Dealers From Virginia and North and South Carolina



## Ford Truck Sales Increase 90 Per Cent Over Last Year

### Large Gain Reflects General Business Prosperity in United States, Company Declares

DETROIT, July 19—Ford truck sales for the first six months of this year were 97,123, a gain of nearly 90 per cent over the corresponding months of 1922. In June truck sales were 17,774, an increase of more than 6,000 over the same month in 1922. The increased business in trucks reflects the prosperity of general business in the United States in a larger degree than passenger car sales, the company declares.

Increasing demand for tractors is general throughout the agricultural sections, the company reports, about 90 per cent of total output going to farms and about 10 per cent to industrial users. Sales of Fordsons for the first six months totaled 44,023, an increase of nearly 8,000 over the same period last year.

Combined sales of cars and trucks in the United States which totaled 894,078, in the first six months, represents an increase of 354,975, or about 65 per cent, over the same period last year. Increased buying of cars and trucks gives every indication of continuing, the company asserts.

Lincoln sales in the six months period totaled 3,512, which compares with 5,242 for all of last year. Sales of Lincoln by months were, January 631, February 358, March 338, April 625, May 778, and June 782.

### H. J. EDWARDS WITH STEARNS

CLEVELAND, July 23—H. J. Edwards has been appointed works manager of the F. B. Stearns Co., makers of the Stearns-Knight motor cars. He will have charge of production of all types of cars manufactured by the company.

He became interested in the Knight motor at the Daimler Knight exhibit in London in 1908 and was so impressed by it that he recommended its adoption by the makers of the Stoddard-Dayton. He then made an exhaustive study of the engine and the methods of manufacture at the Daimler factory in England and built an experimental engine based on the Knight principle. In 1912 he formed the Edwards-Knight Motor Car Co. and a year later sold his interests to John N. Willys.

## Manufacturers Put Tires on Bargain Shelf in Chicago

CHICAGO, July 21—Manufacturers of standard makes of tires are conducting bargain sales through their Chicago dealers. Large advertisements are appearing in Chicago newspapers quoting prices much below the standard list and containing the names of dealers at whose stores the tires may be purchased at these prices. The advertisements stress the fact that tires will be delivered and applied without extra charge. It is emphasized that these are not "gyp" tires, but standard goods. Among the tires advertised in this way are Mason, Good-year and Oldfield.

### TO PRESIDENT IN 20 YEARS

WARREN, O., July 23—Executives of the Packard Electric Co. gave a surprise dinner last week for N. A. Wolcott, president and general manager of the firm, in celebration of his having completed 20 years with the company. Wolcott first began work with the company as a designing engineer.

### SHOW DATES POSTPONED

MUSCATINE, Ia., July 21—The Muscatine automobile show dates, set for Aug. 22 to 25, conflict with the West Liberty fair, and officers of the association have postponed the show until Sept. 5 to 8.

## New Elgin Company Names Heads of Some Departments

### Plant at Indianapolis Reported Nearing Readiness to Start Production

INDIANAPOLIS, July 23—Elgin Motors, Inc., the reorganized Elgin concern which took over the well known Federal Motors plant of this city some two months ago, has about completed the rearrangement and revamping of the three buildings of the group to suit Elgin production. The factory and general office staff has been organized and preliminary work has been started in many departments, to insure production early in September.

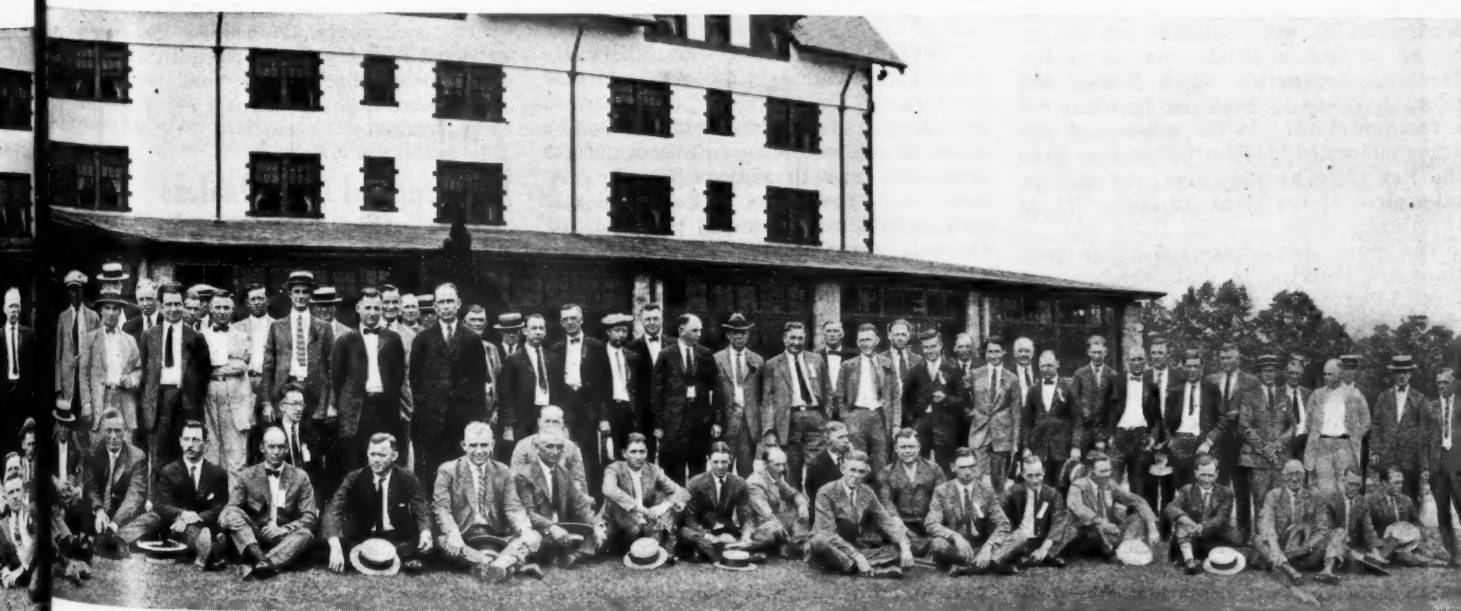
President J. H. McDuffey announced the names of several men who will head departments. M. W. Blank, who was in charge of Cole production, is the works manager. George S. Brown, who was associated with the purchasing department of Cole, has been made purchasing agent, and Walter Blancke, who was for many years identified with the Bosch Magneto Co., will be auditor.

Announcement of the sales department personnel will be made in a short time. Complete details of the new model Elgin which the company will manufacture and produce are also promised for release in a short time.

### MOON HAS HIGH EARNINGS

ST. LOUIS, July 21—Moon Motor Car Co.'s earnings for the first six months totaled \$751,410, before taxes, the company announces. Net profits, after taxes, are reported at \$649,970, compared with net income, after taxes, of \$795,139 in the full 1922 year. Sales for the first six months ran 200 per cent ahead of sales for the same period last year. Closed car demand was from 60 to 65 per cent.

Photographed at Kenilworth Inn, Asheville, N. C.





## Motor Car Dealers' Association Organizes Public Used Car Market to Aid Its Members

Certified Public Motor Car Market, Is Name of Sacramento Dealers' Appraisal Bureau Where Owner and Dealer Are Protected

SACRAMENTO, Cal., July 21—In an effort to help its members in solving the used car problem, the Motor Car Dealers' Association of Sacramento has organized the Certified Public Motor Car Market, headed by Arthur Jack as manager, and with nineteen dealers in it. The announcement by the dealers' association covers the objects and methods of the new association as follows:

"The aims of the Certified Public Motor Car Market are public protection through the standardization of used-car values. The motor car dealers of Sacramento have organized this market on a non-profit basis. It is our purpose to operate the used car market so that the prospective buyer and the owner of a used car are both protected. The buyer will receive a car guaranteed to give him the service, the transportation, he seeks to buy. The owner wishing to sell will receive full value of his car in cash, with which he can go into the market and buy another automobile if he desires, or do what he pleases with the money. There are no restrictions. Strangers and residents of Sacramento will receive the same consideration. This is a motor car market operated for the benefit of the public, in which every one can transact his or her motor car business.

"When a prospective buyer of a used car enters this market, he will see the various models of the standard automobiles which are for sale in Sacramento. The facts will be told him about any car in which he becomes interested. He is assured that the car is in the proper mechanical condition, since all

the cars offered for sale in this market will have been reconditioned by the dealer in that particular make of car. The car has been thoroughly examined in the mechanical department of the dealer selling that car; the necessary work has been done and the car is placed on sale with that dealer's O. K. Since the dealer is directly and vitally interested in the service and satisfaction given by the car he sells, he is sure not only to put the car in good condition, but to tell the prospective buyer the exact truth about it.

"By this method of merchandising used cars, the buyer purchases a definite service, and he is assured of that service when he buys his car in the Certified Public Motor Car Market. The owner of a car who wishes to sell it takes it to the manager of the market, who makes an appraisal based on its actual value, less cost of conditioning and less 10 per cent of the selling price, which covers the cost of selling. He is then issued a certificate of appraisal, stating the net amount due him on the car. A bank will accept that certificate as security for a loan of 50 per cent of the face value until the car is sold, when the owner will receive the balance. Or, the owner can take the certificate to any automobile dealer in the association, and that dealer will accept it in part payment for a new car.

"By this method, the owner receives full cash value for his automobile, without restriction, which constitutes protection of the value of his property, and its salability at all times."

## Sale of Liberty Plant by Receiver Put Off to Sept. 6

DETROIT, July 20—Sale of the Liberty Motor Car Co. was postponed by the receiver to Sept. 6 at the request of the creditors' committee which desires the additional time to work out its plans for a reorganization. In the absence of any other interested bidders the receiver fixed the new date as requested, the sale to take place at the plant, 12 noon. There is no upset price.

The reorganization toward which creditors are working is that which would unite Liberty with Columbia, and though no official reports have been made on the progress of the matter, all preliminary steps indicate that the plan is favored by interested parties. Business conditions are such that there is no necessity for the matter being pushed through to completion at once. Purchase in the fall will give new owners opportunity to realize immediately on fall business, and will also permit changes that may be necessary for spring manufacturing.

The Liberty plant is the last manufac-

turing unit of any importance in this district to remain in receivership. C. H. Wills & Co. and Republic Truck are back in operation under private control.

## MITCHELL CREDITORS MEET

RACINE, Wis., July 23—An important meeting of creditors of the Mitchell Motors Co., Inc., was held at Racine today to receive the formal report of the appraisers and to arrange for the disposition of the assets. The public sale will be held Aug. 15 and it is stated that there is a combination of local capital which will be ready to enter a bid for the plant as a whole, while outside interests have asked for the inventory and appraisal report. The Mitchell plant, while not being operated on car production, is employing a part of the regular force in making up parts and keeping the service department in action.

## TWO MODELS INCREASED

ROCK HILL, S. C., July 23—The Anderson Motor Car Co. has increased the price of its sport touring model from \$1395 to \$1445 and its sport sedan from

## Packard Dealers Allowed to Sell \$4500 Motor Boat

Craft Is Equipped With Packard-Built Engine Adapted From the Single-Six Model

DETROIT, July 21—Through an arrangement that the Packard Motor Car Co. has entered into with the Great Lakes Boat Building Corp. of Milwaukee, the latter company is given permission to sell its Packard motor equipped boat through such members of the Packard sales organization as are in position to promote and successfully handle motor boat sales. The arrangement so far as sales are concerned rests between the boat company and the dealer, Packard participating only in so far that it consents to its dealers handling the boats if they care to.

In the plan to permit dealers to combine motor car and motor boat sales wherever feasible, there is offered the possibility of developing boating as a much more popular sport than it is now, Packard said. As its share in the development, the Great Lakes company will produce a standard craft, the price of which will be \$4500. Packard will build the engines, which will be an adaptation of the single-six, designed for marine use.

General description of the boat shows that it will be a 26 ft. mahogany runabout of the de-luxe type, with a speed of 18 to 20 miles an hour. It will have a cedar plank bottom and will be upholstered in blue leather with box spring seats. It is the aim of the builders and the Packard company to have it conform in its appointments to the Packard cars.

The Packard organization through which the company may sell its boats numbers about 800 but it is not expected that the sale for the present will extend beyond the larger dealers or those smaller dealers especially well situated to handle boats. The proposition, however, is open to the entire organization. Servicing will be centered in the hands of the boat company, dealers not being expected to carry any parts until at least such time that their boat business mounted to a point where a stock would be warranted.

## Hundreds of New Dealers Start Business in South

ATLANTA, Ga., July 23—According to information received at the State Capitol in Atlanta there were more new dealer companies formed in the various southern states the first half of 1923 than ever before over a six months period in the history of the automotive industry in this section. While definite figures are not available, it is indicated by a reliable source that more than 300 new agencies for handling automobiles have been formed in the South the first six months, with a majority of these in Florida, Georgia and the two Carolinas.

## CONCERNING MEN YOU KNOW

E. A. Travis, for many years general sales manager of the Locomobile Co. of America, has resigned from the Locomobile organization and will terminate his work with the recently re-organized company on Aug. 1. He has not announced his future plans.

Bailey & Co., of Atlanta, one of the South's largest accessory and parts jobbing concerns, announces the appointment of George L. Shadburn, Jr., as general manager of the company. Shadburn has been with the company since its organization, and was the first man employed when the company was formed several years ago.

The Atlanta branch of the Martin-Parry Corporation announces the appointment of D. E. Small, Jr., as general manager of the branch, succeeding R. D. Brown, who has been named district sales manager.

John R. Coleman, who for the past six years has been chief engineer and factory manager of the Selden Truck Corporation, of Rochester, N. Y., has tendered his resignation, effective Aug. 15. Coleman announces his intention to specialize on truck engineering in a consulting capacity. In addition to acting in a like capacity for the Selden Company, he will also handle several other accounts with headquarters at 64 Lovering street, Buffalo, N. Y.

J. D. Weks, for the past year with the Bassick-Allemite Manufacturing Co., of Chicago, as factory representative, has been appointed general manager of the recently opened New York city branch of the Allemite products, with headquarters at 1885 Broadway.

James T. Wilson, vice-president and assistant manager of the Nash Motors Co., has taken over direct charge of the company's four-cylinder car department, following the resignation of B. W. Twyman. Wilson has been assistant manager of the Nash company ever since its organization and has been vice-president for the past three years. He has followed the fortunes of Nash since the days of the Durant-Dort Carriage Co., following him to Buick and joining him in his new venture at Kenosha.

J. C. Puritz, Jr., has been appointed manager of the Omaha branch of the Stewart-Warner Speedometer corporation. Puritz was a former assistant manager of the Chicago office.

J. L. Castle, formerly general manager of the Standard Motor Parts Co., has joined the staff of the George W. Davis Motor Car Co., of Richmond, Ind.

R. M. McCormick, of Philadelphia, for several years with the Liberty Motor Car Co., and more recently connected with the Charles Chalmers interests in Philadelphia, has been appointed district sales manager for the George W. Davis Motor Car Co., with headquarters in Philadelphia.

George C. Hewes has been appointed field secretary of the Utah State Automobile Assn.

W. G. Firth, formerly of the Minneapolis branch of the Willys-Overland, has taken over the management of the Omaha branch of the same company.

C. W. Walsh has been appointed general manager of Russel Motor Axle Co., succeeding John Coapman, resigned.

Ralph Kaye, for seven years advertising manager of the Kissel Motor Car Co., of Hartford, Wis., has resigned and for the time being is enjoying a vacation during which he will endeavor to improve his golf score. Kaye is undecided whether to continue in the automobile field or take up one of several offers in other lines which he is considering.

Milard H. Newton has succeeded David Cameron as Cleveland district manager of the Electric Railway Journal and Bus Transportation. Newton has been connected with the advertising department of the White Co., of Cleveland, for the past ten years, the last six as advertising manager. Previous to this, for three years he was divisional advertising manager of the United States Motor Co.

Ross Hopkins, formerly of the Motor Equipment division of the Klaxon company, of Detroit, has been made general sales manager of the Inshield light, manufactured by the Thal & Bitter Machine Co., Toledo, Ohio.

M. H. Blank has been named as works manager of Elgin Motors of Indianapolis, of which J. H. McDuffee is president. Blank formerly was assistant general manager in charge of engineering and production of the Cole Motor Car Co. and also has been connected in similar capacities with the Aluminum Manufacturers, Inc., Continental Motors, Cadillac Motor Car Co. and the General Electric Co.

R. B. Hubbell has been placed in charge of machine tool sales of the Greenfield Tap & Die Co. He is regarded as an authority on grinding, having been associated with the Norton Co. and the Heald Machine Co. previous to his present connection.

Dr. L. H. Baekeland, of Yonkers, N. Y., honorary professor of chemical engineering in Columbia University and president of the Bakelite Corp. and the General Bakelite Co., has been made an officer of the Legion of Honor by France. A similar distinction was bestowed upon Dr. Baekeland, who is the inventor of Velox and Bakelite, by King Albert of Belgium in 1919 when he was made an officer of the Order of the Crown of Belgium.

James E. Auten, for two and one-half years director of purchases, LaFayette Motors Corp., Milwaukee, has been promoted to the post of works manager of the four-cylinder car division of the Nash Motors Co. at Milwaukee. Auten was for six years with General Motors, first as manager of the Liberty motor activities of Cadillac and later as manager of the Samson Tractor Co. at Janesville, Wis.

N. J.; Leander M. Funk, Baltimore, Md.; Frank L. Darling, Long Beach, Cal.; C. W. Z. Hilbert, Allentown, Pa.; W. T. Sheckler, Springfield, Mass.; Thomas J. Ferguson, Chester, Pa.; D. V. Barker, Grand Rapids, Mich.; Frank L. Long, Kenosha, Wis.; L. A. Peltier, Holyoke, Mass.; E. C. Crane, Patchogue, N. Y.; Alfred W. Grote, Sheboygan, Wis.; R. M. O'Connell, Pittsfield, Mass.; J. E. Boisvert, Lewiston, Me.; W. O. Swisher, Mansfield, O.; W. J. Gartner, Union Hill, N. J.; C. D. Kistler, Greensburg, Pa.; Russell Shipman, Sunbury, Pa.

### ST. LOUIS TRAFFIC BILL

ST. LOUIS, July 21—An ordinance has been introduced into the Board of Aldermen which would, if passed, revise all existing traffic, speed and parking laws and place control of all such matters in the hands of the Director of Streets and Sewers. He could designate any street as a through street, a one way street, could restrict parking in certain sections to any hour or hours of the day; in fact his word would be law on the subject and he would be expected to handle the entire situation as he saw fit.

## Stockholder in Peerless Asks Collins for Account of Funds

### Files Two Suits in Common Pleas Court Questioning "Bonus" Said to Have Been Paid Collins

CLEVELAND, July 21—David L. Rockwell of Cleveland, a stockholder in the corporation, has filed in the common pleas court in this city, two suits, in one of which he asks the court to force Richard H. Collins, president of the Peerless Motor Car Co., and the Peerless Truck and Motor Corp., to account to the corporations for all money paid him for designing a new car, and in the other suit the court is asked to render judgment against Collins for "many hundreds of thousands of dollars" paid him under a bonus agreement, whereby Collins was to receive \$65 for every Peerless car manufactured.

Collins was touring in the east on the day that the petitions were filed, and factory heads and executives here declined to comment on the petitions.

Collins was president of the Cadillac Motor Car Co., before he came to Peerless. He brought many of his associates in Cadillac and General Motors to this city and put them into his organization. He began his career in the automobile industry, many years ago, as general manager of the Kansas City branch of the Buick Motor Co., which later became a subsidiary of the General Motors Corp. His success for Buick in that territory caused him to be called to Flint, Mich., to become sales manager for Buick. Later he was promoted to the post of assistant to the president of General Motors and his next jump was to the presidency of Cadillac.

### OLDS TO AID TRAFFIC STUDY

LANSING, Mich., July 23—The entire facilities and the personnel of the Olds Motor Works of Lansing, are at the disposal of city and state officials who wish to seek their co-operation in arriving at a solution of the traffic situation prevailing in many sections of the United States, according to an announcement by G. H. Peasley, general sales manager of the company.

"It is time that the automobile manufacturer and the public official got together," Peasley said. "Our interests are the same and there is no doubt but what the automobile manufacturer must cooperate if a solution is to be reached on the question of general safety and the relief of traffic congestion."

### DIRT TRACK RACES IN TEXAS

ABILENE, Tex., July 24—Two days of automobile racing will feature the West Texas Fair to be held at Abilene from Sept. 24 to 29. The race days will be Wednesday, Sept. 26, and Friday, Sept. 28. Entry of many of the leading dirt track drivers is expected. The races will be under the sanction of the American Automobile Association.

## 22 Chandler Salesmen Win Trips to Colorado Springs

CLEVELAND, July 20—Twenty-two retail salesmen for Chandler cars have been awarded prizes in the Pike's Peak retail sales contest conducted by the Chandler Motor Car Co. All the winners will be given a trip to Colorado Springs where, with some of the Chandler officers, a celebration will be held Aug. 6.

Four of the winners sold more than 100 cars each in the 100 days' duration of the contest. The average of the 22 winners, including the small cities, was 57 sales each in the 100 days. In addition to the trip to Colorado Springs the winners will receive gold medals and cash bonuses and at the celebration the salesman whose record is adjudged most meritorious will be awarded a Chandler Royal Dispatch or a chummy sedan.

The high men in the contest were George R. Shiplett, Pittsburgh, 118 sales; J. C. Mullin, Boston, 106; Gus Ehrlich, New York City, 104; Floyd F. Hornbaker, Los Angeles, 101.

Other winners were: Albert E. Smith, Brooklyn, N. Y.; N. R. Snyder, Newark,



## BUSINESS NOTES

Ruggles Motor Truck Co., of Detroit, has been authorized by the Michigan Securities Commission to issue \$250,000 in first mortgage 7 per cent serial gold bonds. Triangle Motor Truck Co. has been granted permission to issue \$100,000 preferred stock to present stockholders only.

Williams Bros. Aircraft Corp., of San Francisco, is erecting a four-story building, 98 by 100 ft., as an addition to its factory. The new plant will be devoted to the manufacture of Williams accelerators for Ford cars and other automotive products.

The Manley Manufacturing Co., of York, Pa., maker of garage and shop equipment, is building an addition to its factory which will add 14,000 sq. ft. of floor space, which will be used as an addition to the main machine shop and by the painting and shipping departments. The addition will cost \$25,000 and be ready in two months. The company also completed recently an entirely new building which is occupied by its general offices.

A large factory for the manufacture of motor trucks and motor busses is to be established at the Old Hickory plant near Nashville, Tenn., which was used as a government manufacturing site during the war, by the M. B. Automotive Corporation, formed recently under the laws of Delaware. The truck will be a front-wheel drive vehicle.

The Ace Automotive Co. is the name of a new automobile agency and accessory firm established this month at St. Petersburg, Fla., with a capital of \$50,000.

The Electric Auto-Lite Co., Toledo, has just opened its new employees' club house on Summit at Buckeye street. Nearly 150 employees at present are members of the club and they with their families were guests at the "house-warming" last Thursday evening.

The North Western Coupe DeLuxe Body Co. has been formed at Potter, Neb., by William Cords and R. A. Babcock.

Mohawk Mfg. Co., Peoria, Ill., is the manufacturer and exclusive distributor of the Mohawk transmissions for Ford cars and trucks, having recently bought out the interest of E. M. Smith Co.

The Geo. H. Rives Mfg. Co., of Brooklyn, manufacturer of detachable rubber pedal pads for automobiles, has been taken over by P. Q. Wray, president of the Standard Motor Parts Co., of Chicago, who has bought all its capital stock and assets. The company will be moved to 1464 South Michigan avenue, Chicago.

The Englert Manufacturing Co., maker of the Dragon Storage Battery, has recently completed a new factory at 25th and Jane streets, Pittsburgh, Pa.

New incorporations in Missouri include the following: The Wedler-Shuford Co., of St. Louis, with a capital of \$35,000. The company will deal in automobile equipment and sundries. The incorporators are H. G. Wedler, J. F. Shuford, Mildred R. Wedler and C. A. Becker. The Oakland Sales Co., of St. Joseph, with a capital of \$5,000. The company will equip and operate an automobile and airplane garage.

## Des Moines Picnic Draws 25,000; Garages Close at 12

DES MOINES, Ia., July 21—In spite of the appalling date, Friday the thirteenth, the jinx was not present when the motor trades men of Des Moines gathered at the state fair grounds for their annual picnic and frolic. More than 2500 Des Moines people connected with the motor trades business of the city attended.

Promptly at noon, garages closed and automobile men, their wives and families, started out to make a day of it. Several hundred decorated cars participated in the parade that wended its way towards the fair grounds. Two bands provided music for the parade and during the afternoon program.

Talent from a local theater supplemented the program participated in by those attending the frolic. Prehistoric automobiles were reclaimed from the junk pile for the one-cylinder automobile race won by a 1904 Cadillac. Merchandise totaling \$1500 was donated by local merchants for prizes at the afternoon's events. A boxing match in the evening ended the day's entertainment.

## TRIES BASEBALL SALESMANSHIP

ST. LOUIS, July 21—Fred Grinham, president of the Grinham-Johnson Motor Sales Co., Chevrolet dealer, has divided his sales force into four teams, each team consisting of an experienced salesman in charge of three men of less experience. The teams have entered a "baseball league sales contest" which is to last three months.

A score board has been erected in the salesroom and base hits form the scoring data. The sale of a chassis, light delivery or Utility Express Chevrolet is a home run; a closed car, coupe or sedan is a "three bagger"; an open car, touring or roadster, is a double, and any used car or \$25 worth of accessories is a single.

## TRAINLOADS OF TRACTORS

MILWAUKEE, Wis., July 23—The fourth trainload movement of tractors from the main works of the Allis-Chalmers Mfg. Co. at Milwaukee, to the Southwest, since Jan. 1, left the plant during the past week. It consisted of forty-three carloads, containing 187 three- and four-plow machines. At Kansas City the train was broken up for distribution by carlots to various points in Nebraska, Kansas, Colorado, Oklahoma, Texas and New Mexico. In April Allis-Chalmers shipped two complete trainloads to the Southwest, and the June production went forward by special train to Fargo, N. D., where its arrival was timed to inaugurate the "Prosperity Week."

## OUTING FOR ORPHANS

CHICAGO, July 23—The Chicago Automobile Trade Association is making arrangements for its nineteenth annual automobile ride and picnic for the orphans and aged persons in all Chicago charitable institutions, which will be held Aug. 15. The committee is raising a fund of \$5000 to be used in entertaining the guests. Five hundred automobiles will be used to carry them to and from one of the city parks where the guests will spend the day. This occasion always has been one of the most successful undertakings of the trade association. Charles E. Gregory is chairman of the finance committee.

## INVESTIGATES RUBBER GROWING

WASHINGTON, July 21—Dr. H. H. Bennett of the U. S. Bureau of Soils has been assigned by the Department of Agriculture to accompany a party being sent by the Departments of Commerce and Agriculture to investigate rubber production and possibilities for rubber growing in Central America. The party sails for Panama on July 25.

## Scheel Stockholders Meet to Discuss Financial Outlook

**Owners Declare \$225,000 Was Paid In and There Is Only \$8000 Cash on Hand**

ST. LOUIS, July 21—Three hundred stockholders of the Scheel Motors Co., 3922 West Pine boulevard, held a meeting last week with a view to ascertaining the financial outlook of the company.

The stockholders claim that in the past three years there has been \$225,000 received for sales of stock and there is only about \$8000 cash on hand, some racing cars and machinery to show for it.

There are about 1500 stockholders in the company, most of whom purchased their shares for from \$1 to \$1.50 a share. Scheel Motors was recently reorganized as a Delaware corporation with an authorized capital of \$2,500,000 to produce a rotary valve automobile engine.

Herbert Scheel, head of the company, says the trouble with the company has been the number of small stockholders who have taken up his time with questions as to the financial status and business policies of the company. Most of the money received has been expended in experimental work, he said, and it is the purpose of the company to manufacture about 12 engines, mount them on chassis and turn them over to automobile manufacturers with a view to having them adopted for use on a royalty basis.

Four Scheel cars were entered in the Indianapolis race but were withdrawn because of mechanical defects which Scheel says was due to bearings burning out in the connecting rods.

## R. P. HICKS DIES

MINNEAPOLIS, July 20—The funeral of Rex Parker Hicks of Minneapolis, one of the four designers of the Liberty motor, took place July 17. He died at his summer home at Navarre, Lake Minnetonka. Formerly he was vice president of the Hicks Tractor Co. of Chicago. When 19 years old he designed a successful gasoline motor for tractor use for the Minneapolis Threshing Machine Co. He designed the first model of the Garden tractor, now called the Boeman. During the war he was associate engineer at the works of the Curtis airplane company. He was 34 years old.

## WILLS-STE. CLAIRE INCORPORATED

BOSTON, July 21—Wills-Sainte Claire, Inc., of Boston and Marysville, Mich., is the title selected for the new corporation which has succeeded C. H. Wills & Co. as manufacturer of Wills-Sainte Claire cars.

Incorporation papers have been filed with the Secretary of State by President Asa Burton Nelson of Cambridge, Treasurer D. S. Carpenter of Winchester, and Clerk J. C. Rice of Dedham. The authorized capital of the company was given as \$15,000,000.

## IN THE RETAIL FIELD

The Auburn Automobile Co. has appointed the Main Garage, Rensselaer, Ind., as direct dealer, and the following as dealers: Soffa's Garage, New London, Wis.; North End Garage, 3850 East Street, Pittsburgh, Pa.; Penn Auto Repair Co., Pennville, O.; Langerman & Meyers, Superior, Wis.; M. C. Kujawa, Stevens Point, Wis.

The White Bear Motor Sales has been formed to take over the Ford sales and service agency at White Bear, which is a lake suburb of St. Paul, Minn. Arthur E. Peterson is president of the company. E. S. Diehl is vice-president and Allan E. Greenman is secretary and treasurer. The company succeeds Bert Arcand & Son, 807 Fourth Street.

The Reilly-Herz Automobile Co., an old-established firm of Minneapolis, has changed its name to Reilly-Craig Co., Twelfth Street and Harmon Place, handling the Maxwell-Chalmers.

P. J. Wagner, of Sterling, Colo., and H. J. Wagner, of Akron, Colo., are now in full charge of the Swanson Auto Co. at Bayard, Neb.

William Pardee has purchased the Wheeler garage at Lewis, Ia., from Lou Wheeler.

W. J. Mohr, of Culbertson, Neb., has purchased the Imperial Motor Co., of Imperial, Neb.

Harry Benne has secured the agency for Chevrolet cars at Stanton, Neb.

Theodore Nomur has taken the agency for the Studebaker at Stanton, Neb.

The Ruegg Battery and Electric Co., of Tecumseh, Neb., has taken over the handling of the Buick in their territory.

E. Canning, of Albion, Ia., has secured the agency of the Dodge cars in his territory.

Hook & Harriot are new Ford agents at Bedford, Ill.

Henry Rucker, of Steinauer, Neb., is now handling the Studebaker in his territory.

H. H. Berg and Dick Crane, of Hamburg, Ia., have purchased the Rock Park Auto Company of that place.

The Curtis Auto Co., 143-147 Eighth Street, Milwaukee, distributor of the Reo in Wisconsin for more than 15 years, has awarded contracts for the erection of a new headquarters building costing about \$125,000, at the northeast corner of Broadway and Martin Streets, to be ready about Jan. 1.

The Daggett-Yewdale Motor Co., 626-630 Wells Street, Milwaukee, Wisconsin distributor of the Gray, has been appointed state distributor of the Westcott.

The Jesse A. Smith Auto Co., 700 Grand Avenue, Milwaukee, distributor of the Hudson and Essex, has increased its metropolitan dealerships in Milwaukee county to six by the award of a retail franchise to A. F. Eckstein, 228 Wisconsin Street, formerly distributor of the Marmon. The other five dealerships are held by C. M. Thorning, 144 Twenty-sixth Street; Mechanics Auto Co., 1914 North Avenue; Downer Garage & Sales Co., 551 Downer Avenue; Matt Stark Blue Mound Garage, Wauwatosa; Jule Burbach, West Allis.

The Mack International Motor Truck Co. has opened a factory branch in Salt Lake City. Willard Richards will have charge of the branch.

The McMaster Motor Exchange has been chartered at Springfield, Ohio, with a capital of \$35,000 to wholesale and retail automobiles, trucks, parts, accessories, tires and gasoline.

Two additions have been made to Motor Row on Harmon Place, Minneapolis, the new buildings being leased by the Oscar N. Nelson Co., agent for Stoughton trucks and Kissel Kars, 1317 Harmon; L. L. Parrish, northwestern representative for the Duesenberg at 1007 Harmon.

The Pelton Piston Ring Co. has been moved by Manager G. F. Herbold to larger space at 1120 Hennepin Avenue, Minneapolis. F. W. Marble, appointed northwestern field representative of the Mason Road King truck, has established himself at 1208 Harmon Place.

The Gilson Motor Co., 1619 Hennepin Avenue, Minneapolis, is now local distributor for the Apperson.

Another step in localization of the motor car trade in St. Paul on Exchange Street between Third and Ninth Streets, is a long lease by the K. T. Wiedemann, northwestern representative of Durant and Star cars, of property at 118 West Seventh Street, occupied by the Dodge Motor Car Co.

The Garfield Auto Parts & Wrecking Co. has been chartered with a capital of \$10,000 to buy and sell new and used automobiles and accessories at 10-12 Garfield Place, Cincinnati, O.

A. J. Aluers is the new Maxwell and Chalmers dealer at Boone, Ia.

Cleveland Automobile Co. has appointed the following new distributors: Cox & Russell, 55 S. Third Street, Mt. Vernon, N. Y.; H. E. Waite, 16 Main Street, Salamanca, N. Y.; Ideal Garage, 27 South Avenue, Bradford, Pa.; Krush Motor Sales, 3858 West 25th Street, Cleveland, O.; Auto Service Station, 9 W. Main Street, Frostburg, Md.; Elza R. Jackson, Lawrenceburg, Ind.; Elmer F. Byrne Motor Co., 4912 Main Avenue, Norwood, O.; R. S. Hysm, 40 E. Broadway, Shelbyville, Ind.; McKinley Simpson, Williamstown, Ky.; Allard Sales & Service, 134 East Schellinger Avenue, Wildwood, N. J.; Liles Auto Co., 621 Broad Street, Gadsden, Ala.

The Link Motor Co., which was formerly the Link-McCluer Motor Co., of Springfield, Mo., will open new quarters at 410 St. Louis Street. L. W. Link, who will manage the company, purchased the controlling stock from R. M. McCluer. He also bought the stock of the Shipp Accessory Company and will consolidate the two stocks.

R. M. McCluer has purchased the stock owned by I. B. England in the England-Brownlow Motor Salvage Co., of Springfield, Mo., and will become one of the active members of the firm.

The Reo Motor Agency at Springfield, Mo., which had been operated by R. M. McCluer for several years, has been sold to C. J. Rhodes, Jr., formerly employed by the Frisco railroad. He will distribute the cars from a garage at 314 South Ribberson Avenue. The company will be known as the Reo Motor Sales Co.

Articles of incorporation have been filed with the county recorder at St. Joseph, Mo., for the Oakland Sales Co., a new concern that will maintain a motor car garage and deal in new and used cars. The company is capitalized at \$5,000.

M. E. Wasson has purchased the interest of R. S. Westervelt in the Cole Westervelt Wasson Automobile Company, of Des Moines, Iowa. In the future the business will be known as the Wasson Auto Sales Company.

Erickson Bros., Boone, Ia., have just completed a fine new building for their general garage business.

Yater & Dody Motor Co., a new firm, was authorized as an Oldsmobile dealer in St. Louis last week by the De Luxe Auto Co. Joseph J. Yater and Campbell C. Dody form the partnership. The company has opened sales and service quarters at 3034 Washington Boulevard.

A chorus of employees has been formed by the Southwest Nash Co., of St. Louis, with Louis Wolff, a salesman with musical experience, as director. Emil Rottersman, one of the assistant sales managers, has formed a quartette called the "Nash Four" and C. E. Montague has formed a sextette called the "Nash Six."

The Buchanan Motors Corporation, Moon distributors in Louisville, Ky., moved to 431 East Broadway in order to secure better sales and service facilities. They were formerly located in the Public Garage Building, Third Street near Broadway.

The annual excursion of the Motor Accessories Trade Assn. of St. Louis will be held on the Steamer J. S. on the evening of July 24.

All Toledo Willys-Overland retail dealers and the branch will be closed on Thursday, July 26, for the first annual picnic to be held at Sugar Island. R. L. Butler and H. D. Little are head of the general program committee. It is expected that more than 500 persons will make up the picnic party.

New Nash dealers in Wisconsin include the following: Antigo Nash Co., Deerbrook; J. P. Kahut & Son, Spring Valley; J. M. Peters, Montfort; Edward Baker Sales Co., Greenwood; and Falun Nash Co., Falun.

The Kline Motor Car Co., Dubuque, Ia., has taken over the agency for the Oakland.

Fred Payne and Gus Litou have been appointed exclusive factory distributors for the Lomar shock absorbers for Detroit and surrounding cities, under the name of Lomar Detroit Co., located at 2932 E. Canfield Street.

Woellhaf Motor Co., Star and Durant distributor in Burlington, Ia., has taken over the quarters formerly occupied by the Farmers Motor & Supply Co., adjoining its own building, 213 South Third Street.

The Greensboro Motor Car Co., of Greensboro, N. C., has been named distributor in the North Carolina territory of the General Motors Co. trucks, according to an announcement by the Atlanta office. R. E. Zimmerman will be in charge of the Greensboro company as general sales manager.

Among new Nash dealers are these: In Texas—Petty Bros. Motor Co., Brown and Hico; Nash Lubbock Motor Co., Lubbock; Goodman Motor Co., 2401 Mechanic Street, Galveston; in Vir-

ginia—A. B. Alexander, Draper; Front Royal Garage, Front Royal; Gragg-Compher Motor Co., Hamilton; in West Virginia—Andrew L. Chafin, 1019 Bluefield Avenue, Bluefield; Burley's Garage, Davis; Frank N. Foote, McGraws; Whitesel & Barger, Petersburg.

G. W. McGrath, Roultny, Vt., has been appointed Nash dealer.

Two new agencies for handling Dodge Brothers motor cars are being opened in suburban Atlanta by F. E. Maffett, Inc., Dodge Brothers distributor in the Atlanta territory. A service station and sales branch is being opened at 515 McDonough Street, Decatur, Ga., and a second at 8 Gordon Street, in West Atlanta.

The Automobile Exchange, Inc., has been formed with \$100,000 capital at West Palm Beach, Fla., and is opening a new distributing agency in that city.

F. E. Maffett, Inc., Dodge Brothers distributor in the Atlanta territory, has started construction at 167 West Peachtree Street, of what will be one of the South's finest service stations and automobile sales buildings when completed. The building occupies a site 50 by 270 ft., and will cost in the neighborhood of \$150,000.

Nash Motors Co. has appointed the following new dealers: Jaspers-Nash Co., Jasper, Ala.; Shannon Garage, Tucson, Ariz.; East Street Garage, Nogales, Ariz.; Huntington Park Nash Co., Huntington, Cal.; Henry Honaker, 223 S. Market Street, Inglewood, Cal.; Green & Burge, 226 Green Leaf Street, Whittier, Cal.; Nash Sales Co., San Fernando, Cal.; Russ & Prows, Nash Co., Panama City, Fla.; Tompkins Motor Co., Augusta, Ga.; G. V. Stanton, Waycross, Ga.; Wm. Waddell, Cedartown, Ga.; George Klein & Son, Galena, Ill.; Motor Inn, Fenton, Ia.; Ridder Auto Co., Klemme, Ia.; T. M. Mountz, Clay City, Ky.; Davis Motor Co., Beattyville, Ky.; Peabody Garage Co., Houlton, Me.; Merrimack Motor Co., Newburyport, Mass.; George N. Beal, Rockland, Mass.

The D. & S. Motor Co. is a new concern in Birmingham, Ala. Incorporation papers were filed the past week, showing C. P. Hammond, R. L. Lange and J. A. Simpson as the men behind the concern. It is understood that they will succeed the Whitlock-McDonald Co., distributors for the Durant line, including the Star, in Birmingham and North Alabama.

Garth Clinkscapes, of Little Rock, Ark., and a former resident of Columbia, Mo., has purchased the Ford automobile agency of Robert Wayland at New Franklin, Mo.

The Mepharm Motor Co., of St. Louis, has been appointed an Oakland dealer by the Mississippi Valley Motor Co. The Mepharm Co. has heretofore handled the Lexington car and will continue to do so. The showroom of the company is at 2926 Locust street.

The Central Motor Sales Co., distributor of the Dodge automobile in Springfield, Mo., has obtained a three-year lease on lots at 306-10 East McDaniel street, adjoining the company's present building. H. D. Wetzel, manager of the company, has announced the additional lots will be used for parking space and for a service department of the company.

The Bellman Garage in Jefferson City, Mo., one of the most modern in the city, was formally opened with a big dance and the proprietors secured a large orchestra to furnish the music, inviting all of the people of Jefferson City to come down and be their guests. As a result a large crowd attended.

Work on a big concrete garage building that was to have been built this spring at Poplar Bluff, Mo., near the Frisco tracks, between Poplar and Cedar street, will be suspended until fall or later, it has just been announced by Mrs. W. W. Turner and her son, Fay D. Bacon, who have plans prepared for the structure. High prices of building material and the high labor scale is given as the reason for the postponement.

Howard Beazley, who has been associated with the Missouri Gas and Electric Service Co., has purchased the half interest of E. P. Barnhill in the Nicholas Young Motor Company, Marshall, Mo., which Barnhill recently acquired. The new firm will continue to distribute the Star and Durant cars under the name of Nicholas & Beazley.

Whitney Harb has opened a new Ford sales and service establishment at Third and Orange streets, North Little Rock, Ark.

The Chamber of Commerce of Clarksdale, Miss., has organized a department especially for the automotive merchants of that city and community.

The John Smith Co., of Atlanta, Buick retail dealer for the past seven years, and one of the pioneer automobile concerns in Atlanta, will give up the Buick franchise on Aug. 1 to take over state distribution of Reo cars and trucks. C. E. Dupre, present Reo distributor, and also a pioneer in the Atlanta field, will retire from the automotive field. Floyd Northcutt, sales manager of the Smith company, is president of the Atlanta Automobile Association.



# The READERS' CLEARING HOUSE

## Questions & Answers on Dealers' Problems

### Cost of Operating a Battery Tungar

Q—We have a 4 battery Tungar rectifier 120 volt A. C. 40-50 cycles, 7.5-30 volts D. C. 5 amps., D. C. We would like to know how to figure the total A. C. consumed by this outfit.

1—For 5 ampere charge to the battery the A. C. consumption is as follows, with one 6 volt battery on the line 155 A. C. watts, with two 6 volt batteries 202 A. C. watts, with three 6 volt batteries 244 A. C. watts, with four 6 volt batteries 283 A. C. watts. At a charging rate of 3 amperes the A. C. watts are 130, with 1 battery on the line, with two 6 volt batteries 160 A. C. watts, with three 6 volt batteries 185 A. C. watts and with four 6 volt batteries 210 A. C. watts.

To figure the efficiency we divide the D. C. watts by the A. C. watts. Taking the case for example of the four 6 volt batteries being charged at a 5 ampere rate. We will take the case where the four 6 volt batteries are nearly charged so that their voltage is up to 7.5 and all four of them together will accordingly have a voltage of 30. Multiplying 30 which is the voltage by the current which is 5 amperes we get 150 watts output while the input is 283 watts. Dividing 150 by 283 we get 53 per cent as the efficiency.

However to figure the cost of current you do not need the efficiency as the A. C. watts determines this. Operating the rectifier at this rate for an hour means that you have used up 283 watt-hours or .283 KWH (kilowatt-hours), then if the current costs you 10 cents per KWH it means that it has cost you approximately 2.8 cents to operate the rectifier for an hour. Ordinarily for battery stations the power current is somewhat cheaper than 10 cents per KWH.

### Water Pump Collapses Hose at High Speed

2—A Buick six was brought into our shop to have a case of overheating remedied. As long as the engine ran fairly slow it would not overheat but when running fast as on a long hill or in low or second speed it would soon come to a boil. We checked the ignition, valves and carburetor and found them O. K. We then checked the water circulation and found it O. K. at low engine speed but found the circulation very poor at high engine speed. We then found that a hose connection at the intake side of the pump would collapse when the engine operated at high speed due to the suction and the fact that the hose was rather old and soft. This closed up the water passage and accounted for the restricted circulation. A. L. Cannon, Big Creek, Cal.

MOTOR AGE wishes to express appreciation for the experience above related. Not only is it of interest in itself but it

### The Readers' Clearing House

**THIS** department is conducted to assist dealers and maintenance station executives in the solution of their problems.

All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks late, depending upon the space available.

Readers' names will not be published with articles, if a request to this effect is received with the letter.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.

Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

brings out a good engineering principle. The operation of the pump not only produces a pressure on one side but produces a suction on the other and it was the suction produced by the pump which caused the old hose to collapse and close up the water passage.

### PUTTING CORK INSERTS IN CLUTCH

Q—Advise as to replacing cork inserts in a Paige 1916, 6-46 clutch. How thick should gage be for cutting the slap of cork, also is there any special cork to be used?—Bottlemy Bros. Garage, Alden, Ill.

Instead of cutting your own cork inserts for this clutch we would advise that you secure the inserts already cut to shape from any authorized Paige dealer. A tool that will facilitate insertion of these inserts can be made from a piece of tubing tapered at the end so as to have a very thin wall and a plunger or rod that will just fit inside of this which will be used to drive the cork into the clutch plate. If the Paige dealer in your town does not have the inserts they may be secured from the Chicago distributor.

### Jerk Due to Advanced Spark May Occur in Any Car

Q—There is a party in this city who emphatically declares that every high speed engine car, even a Mercedes or Rolls-Royce, will jerk at low speed when spark is in advanced position on the quadrant. By "jerk" is meant that familiar semi-buckle which some cars will evince at about 2 or 3 m.p.h. My reply was that his statement was possibly true as regarded the cheaper high speed engine but obviously absurd concerning such machines as the above mentioned—Blandford Harness, Colorado, Texas.

A semi-buckle with spark advanced may occur on any car regardless of its type when the spark is advanced, but the occurring or absence of this buckle has nothing to do with the price class of the car. To begin with the Rolls-Royce engine is a medium-speed engine, having a maximum of about 2500 to 2600 r.p.m.; the Mercedes about the same speed. On a car having a large manifold and corresponding low velocity of the mixture bucking will often occur at extremely low engine speeds regardless of the spark position.

This bucking may be attributed to the gas distribution system and has nothing to do with the ignition. Another factor that will produce this is an engine having insufficient flywheel capacity which will cause rough running at slow engine speeds at any spark position, but will not give rise to a semi-buckle unless the engine is pulling. Any engine no matter how well designed will show signs of laboring and possibly will produce the effects you describe if the spark is too far advanced for the speed of the engine.

The reason that bucking may have been observed in engines designed for speed only more than in the medium and low speed types is because of the greater difficulty in securing proper fuel distribution through the full speed range on the high speed engine, it usually being less smooth in operation at low speed than in the semi or low speed types. In conclusion we might add that any engine regardless of its characteristics and price will not operate smoothly at very low engine speed on a full advanced spark.

"What Tire Reputation Means to the Dealer," the tenth of the series of articles on tires, appears on page 21, this week. Read it.

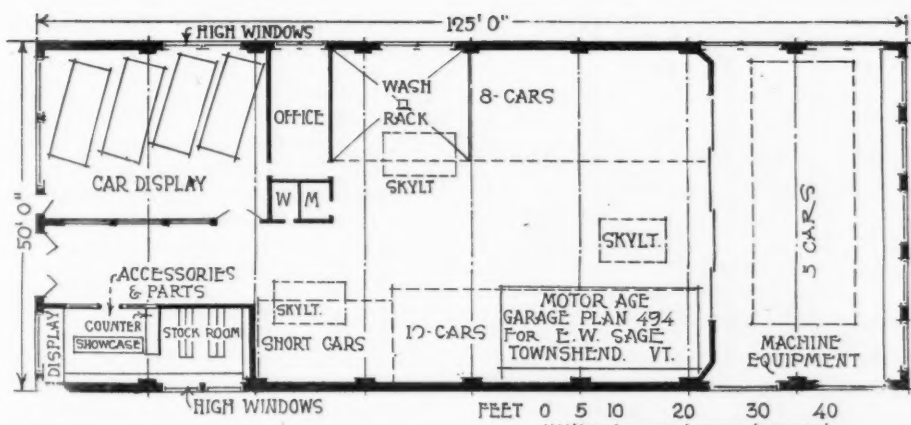
## Rear Location Best for Repair Shop

I am thinking of erecting a garage of about 50x125 ft. in size, to be of steel span construction without posts, giving a clear floor space, same to have center entrance. We would like to have a showroom in front for three or four cars, also an office. We would like to have the front space for accessories stock and parts and the back part for a machine and repair shop.

What do you think about the width? Will it be wide enough to give space to store cars on both sides and give ample room in the center for cars to enter and get out? Also tell us how many cars we can store on this floor space. The heating plant will be located in basement room. I am enclosing a drawing showing the plan of the floor, etc., which will give you some idea of what I have in mind.

Any information you can give me on this will be greatly appreciated and thanking you very kindly, I am, E. W. Sage, Townshend, Vt.

As you will note from our layout we have made a good many changes from the suggestions that you sent us. In the first place, we have moved the entrance slightly to one side in order to get more room for the car display. In the next place, we have placed the repair shop across the rear of the building, as we believe this would be a much better position than at one side. In the third place, we have united the stockroom with the accessory store instead of combining it with the showroom and office.



### Architectural Service

IN giving architectural service, MOTOR AGE aims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and, in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things, we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how large it is expected they will be.

Number of cars on the sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

How much of an accessory department is anticipated.

This last is the better arrangement, as it is necessary to have more or less stock along with the accessories and it saves

having two places to use the same stockroom for parts as well as accessories.

Side windows in the garage section are more or less useless, as cars backed up against them shut out all the light. For this reason, it would be better to light the garage room with three skylights, making the only side window opposite the wash rack, which side light helps out some.

If you use the plan of the Austin front elevation that you sent us you will of necessity have to change our plan somewhat, but we do not think that the change would harm its appearance materially. Trusses, of course, would be used just as well with our plan as with the one you suggest.

## WEAK MAGNETO REQUIRES HAND CRANKING

Q—We have a 1916 Chandler with Bosch magneto that will not start with starter although starter turns engine at good speed. Just as soon as engine is cranked one little turn she starts right off, that is when the engine is cranked by hand.—Louis Deig, Howell, Ind.

Your statement that the starter cranks the engine at a good speed is rather indefinite, although it is possible that a magneto that will not start at the cranking speed produced by the electric starter will often start when cranked or spinned by hand. If you are positive that the starter is turning at its normal revolutions; that is, that the engine is being cranked at approximately the same speed as the starter on a Chandler car known to be in good shape, it indicates that the ignition trouble lies in the magneto. Just what portion of the magneto that is at fault can be determined only by test. We would suggest that you have the magnets recharged and that you carefully examine the interrupter contact points. If neither one of these improve the performance any we would suggest that you send the magneto to an authorized electrical repair shop or to a Bosch authorized service station.

2—We have a Buick D45 with cone clutch that clashes every time the gears are shifted. The gears seem to be in good

shape. We have oiled throwout and re-lined clutch brake of clutch but with no result.

2—The first essential in order to secure good gear shifting is to have the clutch spider fully disengaged at the time of shifting. We would suggest, therefore, that you make sure that the throwout bearing and clutch pedal linkage give you the full throwout range of the clutch and that the leather facing is not touching the flywheel when the pedal is depressed. The next point to look for is too tight an adjustment of the clutch, and misalignment of the clutch spider.

3—We have a Dodge car with a clutch which will not throwout although pedal goes clear to floorboard and brings clutch spring back. The clutch still keeps running making it impossible to shift gears.

3—If the clutch hub is well lubricated and the ball bearing clutch release, which receives its lubricant from a tube which comes up from the floorboard, is lubricated and not badly worn the clutch should release. If both the items mentioned are O. K., it will be necessary to disassemble the clutch and clean the dirt out from between the clutch facings. Before you tear down the clutch make sure that the clutch is not too tightly adjusted and for further information regarding adjustment and maintenance of the clutch we would refer you to the Dodge instruction book.

## RESISTANCE IN GENERATOR FIELD CIRCUIT WILL REDUCE OUTPUT

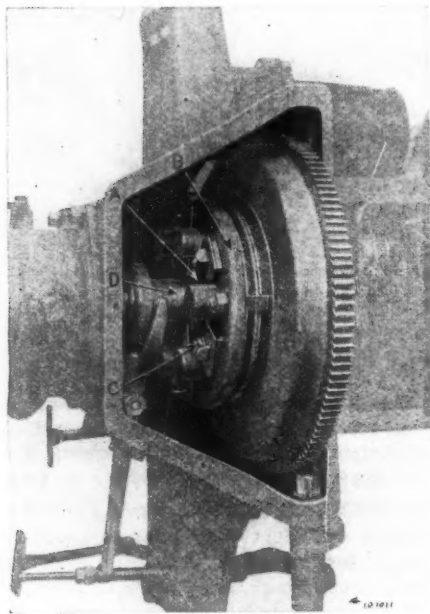
Q—We have a 4-45 late 1917 Buick on which the generator is putting out too much current. This car is being used on long trips and the output of the generator is overcharging the battery. We are unable to get less than 15 amperes by shifting the third brush and in the other direction we can get 22 amperes. Can you tell us what is the trouble and how to overcome it?—Fred Thibest, Tampa, Fla.

1—If you have shifted the third brush as far as it will go, you have obtained as low a current as is normal with this machine. It is designed for normal operation and when the car is used continuously on long trips the usage is abnormal.

A reduction of the current, however, can easily be accomplished. When you turn on the ignition switch you allow the battery current to flow to the ignition coil and another wire connected on the ignition coil carries current to the shunt field of the motor generator. If you will connect either German silver wire or iron wire in series with this connection from the ignition coil to the shunt field you will be able to reduce the output. The resistance may be wound up as a coil and we would suggest taking iron wire such as stove pipe wire and winding it in a small coil. The longer the wire the more you will reduce the output. Also the smaller the diameter of the wire the more the output of the generator will be reduced.



## Adjustments on 1923 Jewett



*Flywheel and clutch in 1923 Jewett*

**Q**—Many thanks for your information relative to the Jewett carbureter. We have acted on your instructions and have made a substantial improvement in the car's operation, although it is not yet performing as well at low speed as it should.

**1**—Trouble in idling may be due to uneven compression, air leaks around intake manifold, excessive clearance around intake valve stems, or possibly due to a spark which is poor at low speed due to burnt interrupter contacts, contacts set too close or a condenser of low capacity.

The spark may be checked by removing a wire from the plug and holding it within 3-16 inch of the engine and counting while 50 or 60 sparks jump at low speed. If they jump without missing a shot it shows the ignition to be O. K.

The compression may be checked by turning the engine over by hand to feel the spring of the compression and to see if all cylinders are about alike. This presents the possibility of a valve in one of the cylinders not having a perfect seat. With a new car this condition of course should not be present, nor should there be excessive clearance around the valve stems.

**2**—We would like to get information on the Long clutch as used in the 1923 Jewett. Show operation and method of making adjustment, also lubrication and attention needed by the clutch.—Maurice H. Decker, LaPorte, Ind.

**2**—Two illustrations are given, one showing the flywheel and clutch while the other shows the outside of the flywheel housing and shows the adjustment at A and B, these being the only adjustments that should ever need attention.

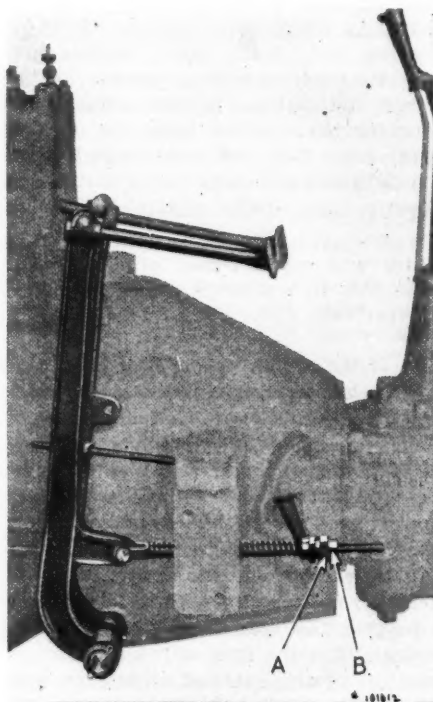
Referring to the illustration of flywheel and clutch, the pressure of the coil spring is exerted directly against the frictional surfaces of the clutch. Any wear that may occur to the ray-

bestos facings in service will be taken up automatically with little or no effect upon the spring pressure. Wear will take place very slowly and the facings should last indefinitely in normal use. A slight amount of wear however, takes place from time to time and as it occurs the centers of the retractor levers A shown in the illustration will approach and eventually rest upon the cover B, thereby limiting the expansion of the coil springs and preventing their pressure from being exerted to hold the clutch engaged. When this point is reached it will be known by the loss of power transmitted to the rear wheels and it will be necessary to have the facings replaced.

No adjustment should be made to compensate for the wear in the facings.

The only adjustment which may be necessary is that of the nut A shown in the other illustration after the lock nut B has been released, to provide for a clearance between clutch pedal and the floor board. As the facing wears the clutch pedal will be caused to approach and eventually rest against the underside of the floor board so that the adjustment at A and B is necessary. The clearance under the floor board should be from 1/2 inch to 1 inch.

The bearing at the rear end of the retractor sleeve as well as the latter, is lubricated by the oil in the transmission case, through a hole at the center of the clutch shaft, which extends at an angle to the surface, near the center of the sleeve. Small holes are drilled through the sleeve by means of which the oil may reach the bearings. The roller bearing at the front end of the clutch shaft is well packed with grease when the clutch is assembled and this will last indefinitely.



*Adjustments for Jewett clutch*

## WRIST PIN BUSHING LOOSENS FIRST

**Q**—We are going to regrind a 9-N Continental motor in the near future and would like to know if there is any accepted method of changing the piston pin bearing from the connecting rod to the piston. We intend to put in Kant-Skore pistons and want to clamp the pin in the rod, as it is our experience that the first bearing in this type of motor to get loose is the wrist pin bushing in the connecting rod.—Peshastin Garage, Peshastin, Wash.

We do not know of any approved method of changing the construction of the rods that would allow of anchoring the pin in the rod itself. To get a neat job on this proposition it would be necessary to get a new connecting rod with a split end. We believe however, that you will find the wear on the piston bushing in the connecting rod materially decreased by the installation of light weight pistons. If you wish to still further decrease the amount of wear on this installation you can do so by having the piston pin float in the piston and in the connecting rod. With this type of construction however, it will be necessary to use spring rings for locking the piston pin in the piston bosses. It would not be a very difficult job to cut a groove all around the inside of the piston boss at each end and insert one of these spring wire locks and by so doing you will have almost doubled the bearing area of the piston pin.

## THIS GENERATOR DOES NOT CHARGE

**Q**—Let us know what causes the following trouble with a motor generator on a 1916 Buick. This generator does not charge and by shifting the third brush as far as it will go in the direction in which armature rotates it does not make any difference. However, if the screws are taken out of the third brush arm and the brush is shifted a little farther then it generates O. K. but the charging rate is a little bit too high.

The owner of the car does not want to have longer slots cut in the holder as he claims the generator was working O. K. before. Would like any suggestions you have to offer.—Montana Subscriber.

We suspect that you have a grounded third brush holder. One main brush is normally insulated and the other normally grounded, while the third brush holder should be insulated. The field winding is connected from the insulated main brush to the insulated third brush and if the third brush holder becomes grounded, it means that you have two grounded brushes on the armature, so that these two brushes temporarily give the same effect as a shorted armature. When you move the third brush over too far you get it so near the normally grounded main brush that the effect of the short circuit is very slight and the generator can then operate. If you disconnect the field winding from the brush holder and test with a 110-volt line with a lamp in series we believe you will find the brush holder grounded.

*Bill Fixit will entertain you with another interesting adventure if you will turn to page 17.*

## Information on Old Model Chalmers

Q—We have an early model Chalmers car on which we desire information. This car has a 4 cylinder engine with overhead intake valves and L head exhaust valve, two sets of spark plugs and low tension magneto. It is right hand drive and control with 4 speeds forward and one reverse. Has 36x4 clincher tires with demountable rims. Can you give the year and model of this car?

1—Although you do not state the serial number the specifications of the car tally with the model 36, Chalmers also known as the model 10 which was produced in 1912.

### Locating Odd Size Tires

2—Can we get 36x4 straight side tires to fit by changing the rims?

2—36x4 is an odd size and practically obsolete, however, we would advise that you communicate with the Tire Rate Book, 239 W. 39th St., New York, N. Y., as this firm carries a stock list of the odd size tires in the warehouses of the various rubber companies and can advise you whether or not this size is procurable. If it is intended to operate the car for one or two years more it would be advisable to cut down the wheels to one of the standard sizes.

### Double Ignition Not Standard on This Chalmers

3—How were the two sets of spark plugs used on this car?

3—The second set of spark plugs was probably added to the engine after the car had left the factory as we have no record of any model of the Chalmers car being equipped with double ignition using two sets of plugs.

### Maximum Speed

4—What was the maximum speed?

4—The maximum average speed of the model 36 was approximately 55 to 57 m.p.h.

### Wiring Diagram and Oiling System Requested

5—If possible send wiring diagram and diagram of the oiling system.—New Mexico Subscriber.

5—The model 10 and 17-36 Chalmers used acetylene headlights and compressed air type of starter and the only actual wiring on the engine was the ignition circuit. The diagram of the Splitdorf and Remy low tension ignition systems have been published in *MOTOR AGE* from time to time and we would advise that you consult one of the back numbers regarding it. The external piping of the oiling system is shown in the illustration.

The engine is lubricated by what is known as the constant level splash system. The bottom of the crankcase contains oil into which, as the crankshaft revolves, the ends of the connecting rods dip, splashing oil over the interior of the engine and lubricating the pistons and piston pins. The level of the oil in the crankcase is regulated by overflow holes which open in the reservoir below. From this reservoir fresh oil is supplied to the crankcase by a gear pump. In passing from the pump to the crankcase the oil goes through the sight feed on the dash thus enabling the driver to know whether

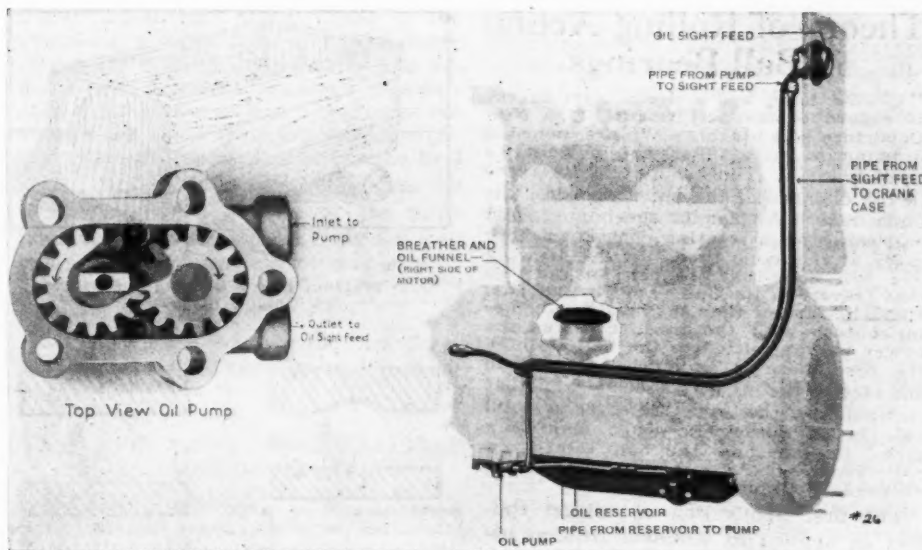


Diagram of oiling system on 1912 Chalmers

or not the oil is flowing properly. Transmission gears and clutch run in oil contained in their respective housings.

The height of the oil in the reservoir is determined by two try cocks on the right hand side of the engine pan. Oil should

be poured into the crankcase through the breather pipe until it just begins to flow out of the top try cock, the level must never be allowed to drop below the lower try cock. The capacity of the oil reservoir is three to four quarts.

### TO ELIMINATE HUMMING NOISE

Q—We have a Chevrolet 490—1922 model. This car has had a new drive shaft, drive pinion, ring gear and differential housing put in. Now it hums continually. We at first thought the drive shaft was not assembled correctly, but later found it put up as it should be. As there is no adjustment I tried shims of different thickness, between the drive-shaft housing and main housing to back the pinion from ring gear but this didn't help it any.

It seems that the hum increases when the car is traveling on the left side of the road. I presume the weight forces the ring gear and pinion against each other, still the thrust washers are new. The cause of the rear axle tearing up was that the driveshaft bearing broke. The axles, axle gears, differential spider and pinion were the only parts that weren't damaged. Give a solution as to what to do to make this axle quiet.—C. A. Boudreaux, Port Arthur, Texas.

We would suggest that you first remove the shims that were installed between the driveshaft housing and the axle housing. Then assemble the left hand housing with the ring gear and axle shaft assembly and place the driveshaft housing with pinion onto the left hand housing. When the driveshaft is drawn down to its permanent location you can see whether the pinion goes into full engagement with the ring gear, and can determine whether it should be backed in or out. Generally speaking, no adjustment will be necessary.

While the axle is in this condition it is advisable to see the end play existing between the position of full mesh on the ring gear and when it is pushed against the thrust washer on the left hand housing. If this portion of the axle seems O. K. then remove the driveshaft housing and without removing the differential and axle shaft assembly bolt the right hand housing to it. When all

the axle housing bolts are drawn up tightly try the ring gear to see how much end play it has. If over .010 end play exists it is proof that the thrust washer in the right hand housing is not of sufficient thickness to keep the ring gear from jamming against the pinion when any thrust is placed on the left hand wheel. The cure of course is obvious.

### METHOD OF PRESERVING NICKEL AND REMOVING RUST

Q—Inform me what I can use on my nickle radiators to keep them bright. The water here is alkali and I thought it might cause them to get streaked and dull looking, where it gets on them, then too my car will not be in constant use during the winter and I want to preserve the beauty of the nickle.—Chas. Iehl, Gallup, New Mexico.

A mixture for preserving nickle may be made up as follows: two parts of vaseline to 1/2 part paraffin to which add 1/2 pint of finely ground quick lime by heating and stirring. Apply warm by wiping all the nickle parts and where possible wrap with paper which has been coated on one side with the mixture very thin, which will keep off rust and dampness.

To remove rust cover the object with grease and in three or four days rub with a rag soaked in ammonia. This will dissolve the rust without attacking the nickle. If the rust resists this treatment apply a little chlorhydric acid and immediately afterward rub with a cloth so that the nickle may not be affected. Then wash, dry well and polish. Nickle may be polished with ordinary rouge which is used by nickle platers. The above information is taken from *The Scientific American Encyclopaedia of Formulas*.

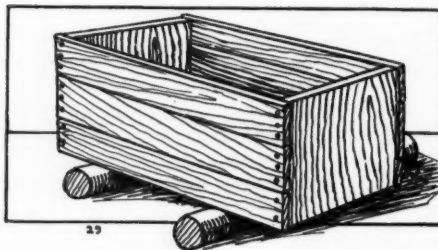


## Theory of Rolling Action in Ball Bearings

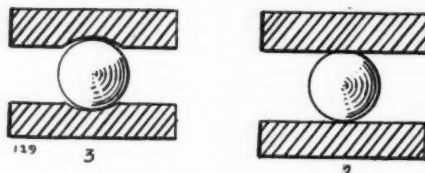
Q—We have had quite a controversy in regard to the performance of a New Departure ball bearing. We are inclosing drawing to more fully explain what we want to know. There is quite a difference in the distance of the outer race and the inner race. We cannot see how a solid ball can have a rotating contact on both races at the same time. In the drawing you will note that the part of the ball that travels in the outer race, will travel 5.1295 in. farther than the part that comes in contact with the inner race, as the power is transmitted to the ball through the core there is as much pressure on one race as the other. It seems to us that it would be the same thing as a solid axle in an automobile when making a turn. Explain how the ball rotates on both races at the same time.—Clark & Shepard, Hopkinsville, Ky.

The first application of rolling contact as applied to diminish friction between two surfaces can be traced back to the use of rollers placed under heavy objects to be moved. When a curved body rolls upon a plain or curved surface it has been found that the so-called frictional resistance due to the rolling action is much less than that due to sliding friction for the same load. The exact theory of rolling friction and the necessary coefficient to enable calculations to be made are not very accurately known at the present time and what has been accomplished in the engineers efforts to reduce friction is reflected in the present day roller and ball bearing.

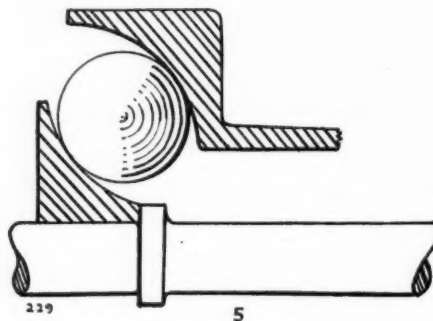
When a curved surface rolls upon any other surface with which it theoretically makes a line or point contact as in a ball bearing the two surfaces deform mutually to each other, the amount of deformation depending on the character and hardness of the materials forming the surfaces and the intensity of the load sustained. If the surfaces of both members are hard and the load is very light its deformation is negligible and true rolling can be practically attained. When an appreciable load is to be car-



The original roller bearing for moving heavy loads



Right—Perfect point contact. Left—More practical construction—slight sliding besides rolling action



Ball bearing for end thrust as well as radial load has rolling action still more imperfect

ried the mutual deformation of the surface destroys the theoretical line of contact and the load is born on a small surface. This occurs even when the surfaces are very hard, and the action instead of being that of pure rolling is a combination of rolling and sliding.

The true theory of this action which is very complex has not been fully demonstrated and is beyond the scope of an explanation in these columns. The nature of this explanation has to do with the elastic properties of materials. The success of modern ball and roller bearings has been made possible by improved materials and workmanship rather than by new theory. That this deformation is probably the greatest factor in the success of ball bearings may be better understood by attempting to roll a round lead pencil under a block of rubber when pressure is applied to the rubber from above.

In the modern ball bearing the ball has two concentric paths of contact as will be seen in Fig. 229-5. If these points of contact are considered as approximately opposite each other then the ball must roll along what might be considered as two discs which will have a common axis of rotation perpendicular to their plane and passing through the center of the ball. In building the bearing these

points of contact or discs must be so placed that the projected discs will intersect on a line passing through the common center of the inner and outer raceway, which means that the circumference of the rolling discs are proportional to the circumference of the path of contact and true rolling is theoretically attained.

However, it is not practical to have more than two points of contact between the ball and one of its guiding surfaces with pure rolling, as the proportionality before mentioned is not true for a condition where more than two points of the guiding surfaces make contact with the ball. We may then, to briefly summarize the theory of the ball bearing, consider the balls as free to move forward at any velocity in relation to the inner raceway, and we may also consider that the path of the balls under ordinary working conditions will be a combination of straight motion around the raceway and a serpentine path around the axis of the ball.

## HIGH TEST GASOLINE HAS LESS POWER

Q—Let me know if high test gasoline would give an automobile more power. Would it be better to add some high test gasoline to the regular gasoline?

1—High test gasoline has less power than the low test gasoline. The only advantage of using it is that in winter it is effective in producing easy starting. Also with high test gasoline where the vaporization is better there is less chance of the gasoline working past the pistons and rings and diluting the cylinder oil. However, if a car has a carburetor equipped with a hot-spot manifold there is no occasion to use high test gasoline in summer.

2—What percentage of auto trucks have four cylinders?—Chas. Huckfeld, North Branch, N. Y.

2—99 per cent according to Automotive Industries of February 22nd, 1923.

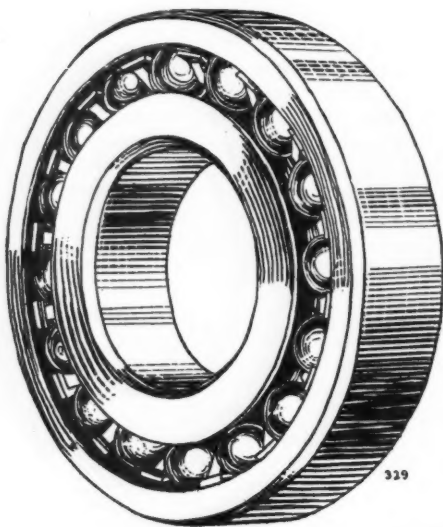
## ON THE VALUE OF PORTING FORD ENGINE

Q—Have you any critical data on the porting of the Ford engine. If a success what size should the ports be, and how much does this increase the hp.?

1—You refer to the drilling of holes in the cylinder wall just above the top of the piston when the piston is at its down position. The theory of this is that the exhaust may more readily be expelled. We know of this being tried on one engine and no noticeable increase was observed in the power available. It also gave trouble at low speed and consumed a great deal of oil.

2—How much may the valve seats be safely enlarged in a Ford engine and how much does this affect the power?—M. M. Carey, Kaylor, S. D.

2—A practice which is not uncommon is the installation of Fordson valves in a Ford engine. This increases the power somewhat but the exact amount would depend on other conditions which are difficult to predict.



A typical ball bearing has a retainer to hold the balls apart





# BOOSTING ACCESSORY SALES

"NOW is the time to prepare for Christmas," says the A. E. A. and the dealer who heeds this advice and looks to the cold weather and holidays, now, will be on the profitable end of winter business. The old-time fears of the motorist about winter driving have been thoroughly routed by the new, comfortable models of cars, both open and closed, reaching the market in the last two years.

Every open car sale of the summer time is a prospect for a winter top, a heater, robes, anti-freeze treatments, engine aids for cold weather driving and numerous other things. Why not get busy now and make your plans for an aggressive campaign to sell winter touring, just as you have sold summer touring? It can be done, appealing, as always, to the call of the outdoors. Summer, as you know, has its call but winter sports are also increasing in popularity because of the handiness of automobiles.

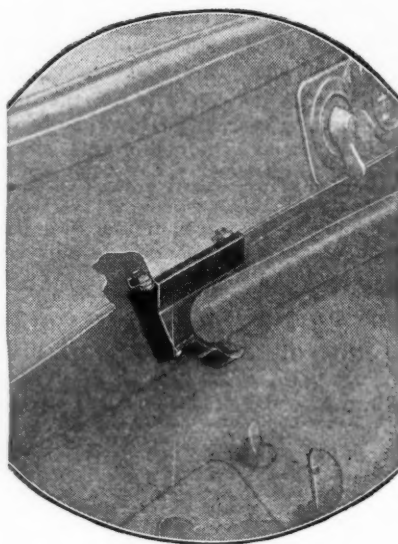
Look, now to the holidays and make this an automotive Christmas.

It is almost pitiful to think of the thousands of opportunities that dealers let slip by them on Christmas gift stunts. Last year, two weeks before the great holiday, we met a dealer who had never thought of automotive gifts, until we suggested it. He went right to work and in two weeks, cleaned up as much as he had made in the month before. This year, he's going to get started early.

The Cooperative Chemical Co., 700 N. First street, St. Louis, Mo., has put on the market the Black Mule Elastic Dope for gaskets and radiator hose. According to the manufacturers, this composition prevents leaks in the hose and gaskets. It is put up in gallon, quart, pint, half-pint and quarter-pint sizes.

The Inshield Spot Light, manufactured by the Thal & Bitter Machine Co., Toledo, Ohio, shines through the windshield, being placed against the inside surface of the windshield glass. It is attached to the top, bottom, or side frame, by two wing nut bolts, which pass through two small holes in the frame. The Inshield is made of sheet brass, heavily nickeled and is fitted with a national Mazda precision type, tipless bulb. It can be pointed in any direction and is easily detached for trouble use.

The Arrow Pump Co., Buhl Bldg., Detroit, has incorporated its ring oiled gland and bearing feature in a water pump for the Ford engine. It is a centrifugal pump. The Arrow construction provides a ring oiler that delivers oil to the bearing from a large oil well at each revolution of the shaft. With this lubrication to insure a cool bearing it is practical to place the packing between the hot water and the bearing which prevents anything but oil from coming into contact with it. Installation of this pump is very easy as shown on the in-



*Sterling steering column support*



*Magic rim operator*

stallation diagram. No alteration of the engine is required.

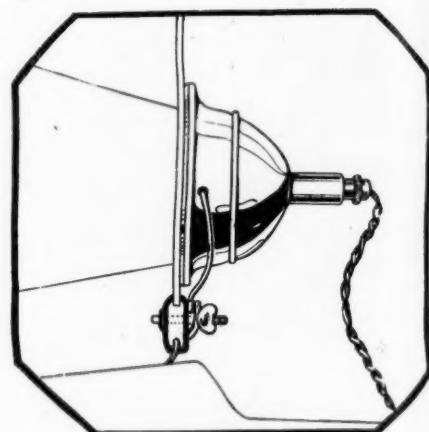
"A steering-column shock-absorber" is the term used by the Sterling Products Co., St. Louis, Mo., to describe their new steering-column support for Fords. This device is the latest addition to the line of Sterling Products.

No holes need be drilled in attaching it. As will be seen from the illustration, it clamps the steering-post firmly to the lower edge of the instrument board, the best position, mechanically, for damping out vibrations in the column.

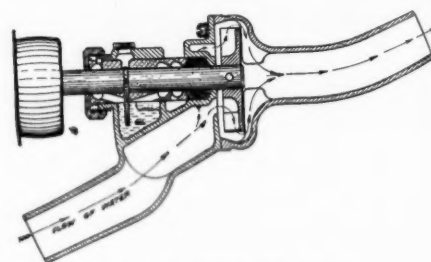
The support has a four-inch bearing on the instrument-board at the lower front edge. At the rear, two flanged washers grip the upturned flange of the board, being held by nuts on the two bolts which hold the whole assembly together.

By simply tightening these bolts, a matter of a few minutes' work with a screw-driver, the Sterling steering-column brace is installed, thus saving the trouble and cost of drilling holes.

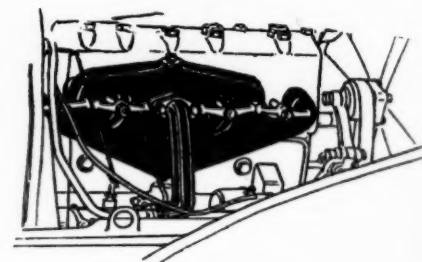
The article is finished in handsome



*Inshield spotlight*



*Arrow pump for Fords*



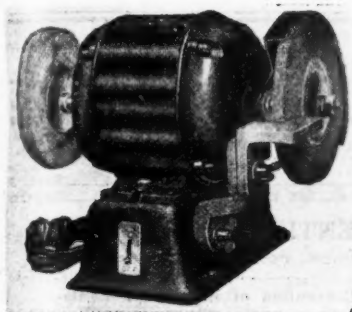
*Dorris distillator*

baked black enamel to match the finish of the car, and is packed, for display purposes, six in an attractive counter-box. The list price is \$1.25.

The Magic Rim Operator is made by the Magic Products Co., Warsaw, Ind. It handles all split rims. Kelsey rims are spread at the split so that they are removed and replaced without damaging the lock. Baker (Buick) rims are contracted and expanded in their normal shape. The price of the Magic Rim Operator is \$20.

A device for trapping the unvaporized portion of gasoline before it reaches the cylinders and boiling it until it does vaporize has been brought out by the Dorris Motor Car Co., St. Louis, for Fords. The device is very similar in construction to the distillator used on the Dorris engine. The distillator for Fords is a combination intake and exhaust manifold with pockets wherein the unvaporized portions of fuel are trapped and boiled. The device can be installed in 30 minutes and costs \$15.

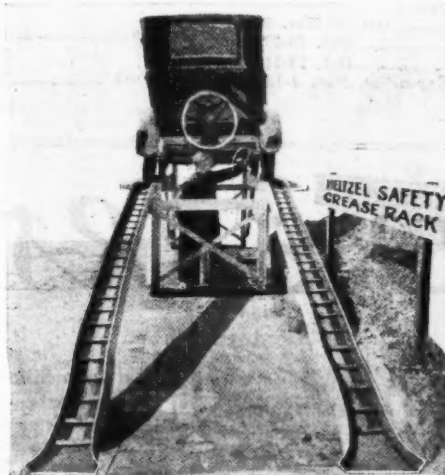
# GETTING MORE OUT of the SHOP



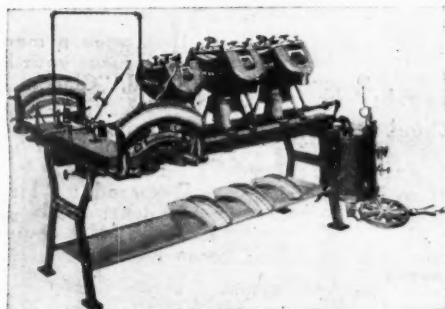
Above—Manley runway  
Left—Marathon grinder



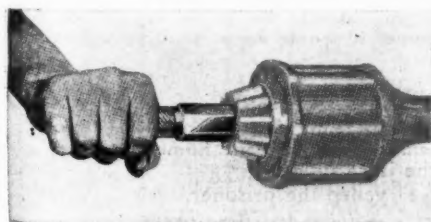
Temco model D drill



Heltzel grease rack



Bub tire repair plant



National wheel and drive pinion puller

HAVE you a certain day set aside, every month of two, when you, personally inspect every item of equipment in your shop, to make sure that each is giving you everything you bargained for when you bought it? Do you know the exact condition of every drill, test bench, screw driver and hammer? If you do not, then plug that leak and make a report to yourself on it.

The Bub Body Corp., Slinger, Wis., announces many types of tire repair equipment, among them many retreaders, molds, boilers, curing mandrels, and, in fact, every item of tire repair equipment.

The Manley Runway is of all steel construction. The floor of the Runway consists of two 8-in. channels, 12 ft. long, making a 26 per cent grade. It is 30 in. high, resting upon 4-in. channel legs thoroughly braced. It is built to jigs,

and the uprights and braces are interchangeable, making it easy to assemble or disassemble.

The Manley Runway is built so that the approach can be made from either side, and equipped with heavy shocks to use when only one approach is in use.

The incline tracks are provided with additional center supports to increase the capacity of the Runway to 10,000 lbs. The Manley Mfg. Co., York, Pa.

Marathon O. K. Grinders are manufactured by the Marathon Electric Mfg. Co., Wausau, Wis. The one shown in the cut is known as Model One Bench Grinder & Buffer. It is one-quarter h.p. motored, the motor being totally enclosed, the base is equipped with on and off switch. One standard cotton buff, seven by three-eighths ins., one No. 60 Norton six by one-half ins. grinding wheel, one guard over wheel base, one adjustable tool rest and 10 ft. of cord and attachment plug, comprise the equipment of this grinder. s. e. cut 22

ment necessary to the vulcanizing plant. In the cut is shown the type S 345 Tire Repair Plant, complete which consists of three sizes of sectional vulcanizer cures for tires ranging in size from three to five and one-half ins., three pair clincher and three pair straight side aluminum bead molds, 1-7 by .36, two plates, two inside curing mandrels, and 1-15 by 15 sheet steel boiler on base, with boiler hood, gas or gasoline burner. This outfit, as set down here, sells at \$260.

The National Wheel and Drive Pinion Puller is designed to meet the requirements of mechanics for a puller which will not injure the axle shaft. The puller is made of cold rolled steel, machined and heat treated. It is operated by screwing the puller to the end of the shaft until the bottom of the puller rests against the end of the axle shaft. The two solid ends thus brought together protect the threads in the shaft, an eighth of an inch remains between the puller and the hub.

The end of the puller is then struck in just the same manner as the mechanic usually strikes the axle shaft to loosen the wheels. The effect is the same as if the nut were screwed partly off and the nut struck, except with the puller bottomed solidly, the thread is protected. The puller is made in sizes to fit all of the large production cars, prices ranging from \$1.35 for the thread size  $\frac{5}{8}$  in.-18 up to \$2.00 for thread size 1 in.-14. For a complete Ford set to take care of the wheels on the model T car, the 1-ton truck pinion gear, Dodge pinion gear, and Overland 4 pinion gear, the price is \$4.65. The tool is made by the National Tool & Machine Co., Jackson, Michigan.

The Temco Electric Motor Co., Leipsic, O., recently developed a new  $\frac{1}{4}$  in. drill called the Model D. It is equipped with a universal fan cooled Temco motor, mounted on ball bearings and equipped with an automatic switch, located in the easy grip handle. One of the features of this drill is its weight, five pounds.

The Heltzel Safety Grease Rack is portable, and yet sturdily built entirely of steel. The cut shows the grooved runways and the ease with which the mechanic can work on a car. It is made by the Heltzel Steel Form & Iron Co., Warren, O.

Stevens & Co., 375 Broadway, New York City, have combined into one chest, a number of tools, known as Group A, for the Ford drive shaft. They consist of the Stevens puller for drive shaft sleeve; the Stevens driver for drive shaft sleeve; the Stevens extractor for spring-acting jaws for drive shaft bushing; the Stevens driver for drive shaft bushing; reaming jig; reamer for drive shaft bushing; refacer for drive shaft bushing; Stevens universal joint tongs and the Stevens giant punch, 16 ins. long, chisel steel, tempered with  $\frac{1}{4}$  in. point. This set sells for \$35, including a hardwood chest.



# COMING MOTOR EVENTS

## AUTOMOBILE SHOWS

Green Bay, Wis.	Annual Automobile Show	Aug. 27-30
Chicago	Commercial Vehicle Show	Sept. 1-7
Sacramento	Annual Automobile Show	Sept. 3-5
Indianapolis	Annual Fall Automobile and Accessory Show	Sept. 3-5
Memphis	Annual Automobile Show	Sept. 28-30
Fresno, Calif.	Automobile Show	Sept. 28-Oct. 5
New York	Annual Closed Car Show	Oct. 1-6
Little Rock, Ark.	Annual Automobile Show	Oct. 8-13
Chicago	Chicago Closed Car Show, Coliseum	Oct. 13-20
Dallas, Texas	Annual Fall Show	Oct. 13-23
Washington, D. C.	Annual Fall Closed Car and Accessory Show	Oct. 20-Nov. 5
Waco, Texas	Annual Automobile Show	Oct. 20-27
Washington, D. C.	Annual Fall Automobile Show	Oct. 28-31
New York	Foreign Automotive Association Exposition	Nov. 4-10

New York	Annual Salon, Hotel Commodore	Nov. 11-17
Chicago	Annual Salon, Drake Hotel	Jan. 26-Feb. 2, 1924
Dallas, Texas	Annual Automobile Show	Feb. 11-17, 1924

## RACES

Pikes Peak Hill Climb		Sept. 3
Italy	Monza Speedway, 500 miles	Sept. 9

## CONVENTIONS

Eric, Pa.	Annual Convention, Pennsylvania Automotive Association	Aug. 13-14
Chicago	Exhibit and Convention of Automotive Equipment Association	Nov. 12-17
New York	National Tire Dealers' Assn. Convention	Nov. 13-15

# SQUEEKS & RATTLES

C'mon gang

## Hamlet for the Prospect

By R. E. Black

To buy or not to buy: that is the question:  
Whether 'tis nobler in the mind to suffer  
The jests and laughter of outrageous neighbors,  
Or take up pen and sign the dotted line,  
And by signing end them. To drive: to ride:  
Ah yes, and by riding find we end  
The heart ache and the thousand shocks  
That flesh is heir to: 'tis a consummation  
Devoutly to be wished. To drive, to ride,  
To ride perchance to dream: ay, there's the rub;  
For as we drive what dreams of trouble may not come  
When we have shifted into high.  
Must give us pause:  
There's the blow-out that makes calamity of so long a drive;  
For who would bear the tire-pump's resisting stroke,  
The road-hog's smile, the tourist's dust,  
The pangs of despised love, the meal's delay,  
The insolence of the office force, and the spurns  
That patient farmers of the novice takes,  
When he himself might be at home in B. V. D.'s?  
Why these duties do not care if we grunt  
And sweat beneath the burning sun  
And dread the sign post at the corner that points into  
That country from whose mud holes no car returns,  
Puzzles the will and makes us rather bear those ills we have  
Than spend our nest egg for something we know not of?  
Thus does procrastination make cowards of us all;  
And thus our yesterday's determined resolution is lost  
In a crepe-hanger's pale cast of thought, and tours of  
Great recreation and moment with this regard their  
Pleasures turn away, and lose for fear of action.

## Which Helps Some

"Whenever we have a  
run-in with a traffic cop, I  
let my wife do the talking."  
"Does that do any good?"  
"Not a bit except to con-  
vince her that she can't win  
every argument she gets  
into."

—Wisconsin Good Roads.

Speaker (at prohibition meeting)—"A friend of mine purchased a barrel of liquor the other day and drank himself to death before it was a quarter gone. Are there any comments on this sad incident?"

Silence, then from the back of the house—"Where's the rest of it?"

—Flamingo.

An old moonshiner, in the Kentucky hills, paid a visit to his local service station every two weeks and each time, he would have the brakes of his car relined. One day he was asked why this operation was necessary so often. He replied, "Well, you see, my garage is located on a hill and if the brakes are not working good, the darned flivver is liable to run down the chimney and put the fire out."

—The Office Pest.

Last week a man was being married and when the preacher said, "This is your lawfully wedded wife," the dumb brute turned and said, "Glad to know yuh."

—Brown Jug.

## Dead Right

Desperado: "Halt! If you move, you're dead!"  
Student: "My man, you should be more careful of your English. If I should move, it would be a positive sign that I was alive."

## He Went to a Hotel

"The next person who interrupts  
the proceedings will be sent home,"  
declared the irate judge.

"Hurray!" yelled the prisoner.

—Black and Blue Jay.

## Probably Wants Her to Help Him

Hubby (driving the car): "I wish you would sit up here in front with me."

Wife (seated in tonneau): "Are you ashamed for people to know we are married?"

—New York Sun.

## Or, a Sledge Hammer

Readers' Clearing House letter says, "One of our customers is having considerable trouble breaking the axle of a 1919 Whos this."

Wonder if he has tried a cold chisel or hacksaw?

The fellow who christens Pullman cars must have quit his job and gone to work thinking up titles for closed models of automobiles.

—Chevrolet Review.

## Accommodating

She (cooly): "Can you drive with one hand?"

He (knowingly): "No, but I can stop."

Now turn to page 21.

LEW BRICATION.

## Current Motor Truck Specifications

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE				REAR AXLE		TIRES	
			Make & Model	Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive	Front	Rear
Ace.....30	1 1/2	\$2600	Mi-112	3 1/2x5	B-L	B-L	Ti-6560	WO.	34x3 1/2	34x5k
Ace.....40	2 1/2	3250	Mi-102	4 1/2x5 1/2	B-L	B-L	Ti-6160	WO.	36x4k	36x7k
Ace.....60	3	3800	Mi-102	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x1	36x8
Ace.....20	1 1/2		Co-N	3 1/2x5	B&B	Cot.	Ti-6250	WO.	34x5n	34x5n
Ace.....30	1 1/2		Co-N	3 1/2x5	B&B	Cot.	Ti-6352	WO.	34x3 1/2	34x5
Ace.....40	1 1/2		Co-J4	3 1/2x5	B&B	Cot.	Ti-6160	WO.	34x3 1/2	34x5
Ace.....60	2 1/2		Co-K1	4 1/2x5 1/2	B&B	Cot.	Ti-6560	WO.	36x4	36x7
Ace.....90	3 1/2		Co-B5	4 1/2x5 1/2	B&B	Cot.	Ti-6760	WO.	36x5	40x10
Ace.....125	5 1/2		Co-B5	4 1/2x5 1/2	B&B	Cot.	Ti-6760	WO.	36x5	40x12
Amer. La France	3 1/2	4950	Ow.	4 1/2x6	Ow.	Ow.	Ow.	WO.	36x5	36x5
Amer. La France	5 1/2	5500	Ow.	4 1/2x6	Ow.	Ow.	Ow.	WO.	36x6	40x6
Armleder	21 1/2		Bu-GTU	3 1/2x5 1/2	Ful.	Ful.	Ti-6160	WO.	34x3 1/2	34x6 1/2
Armleder HWC	2 1/2		Bu-HTU	1 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x4k	36x4dk
Armleder HWC	2 1/2		Co-C4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x4k	36x4dk
Armleder KWB	3 1/2		Bu-YTU	1 1/2x6	B-L	B-L	Ti-6666	WO.	36x5k	36x5dk
Armleder KWB	3 1/2		Co-E1	4 1/2x5 1/2	B-L	B-L	Ti-6666	WO.	36x5k	36x5dk
Atlas	25 1/4	1495	Bu-WTU	3 1/2x5 1/2	B&B	Ow.	Ow.	WO.	34x4 1/2	34x4 1/2
Atlas	40 1/2	1950	Bu-WTU	3 1/2x5 1/2	B&B	Ow.	Ow.	WO.	36x6n	36x6n
Atterbury	20R 1 1/2	2475	Co-J4	3 1/2x5	Ful.	Ful.	Ti-6460	WO.	34x4n	34x6n
Atterbury	22C 2 1/2	3375b	Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x4k	36x4d
Atterbury	22D 3 1/2	4275b	Co-L4	4 1/2x5 1/2	B-L	B-L	Ti-6660	WO.	36x5	40x6
Atterbury	8E 5 1/2	4975b	Co-B2	4 1/2x6	B-L	B-L	Ti-6760	WO.	36x6	40x7
Autocar	21 1 1/2	2200	Ow.	4 1/2x4 1/2	Ow.	Ow.	DR.	34x4	34x6	
Autocar	27 2 1/2	3100	Ow.	4 1/2x5 1/2	Ow.	Ow.	DR.	34x5	36x8	
Autocar	26 1 1/2	4200	Ow.	4 1/2x5 1/2	Ow.	Ow.	DR.	34x6	36x12	
Available	JH 1 1/2	2450	He-O	4x5	B-L	B-L	Ti-6460	WO.	36x3 1/2	36x5
Available	H 2 1/2	3160	He-CU3	4x5 1/2	B-L	B-L	Ti-6560	WO.	36x4	36x8
Available	H 3 1/2	4175	He-MU3	4 1/2x5 1/2	B-L	B-L	Ti-6666	WO.	36x5	40x5d
Available	H 5	5375	He-T3	5x6	B-L	B-L	Ti-6760	WO.	36x6	40x12
Avery	1 1/4		Ow.	3x4	Ow.	Ow.	To-OX2	IG.	34x5n	34x5n
Bessemer	G 1	1450	Co-N	3 1/2x5	Ful.	Ful.	To-A	IG.	35x5n	35x5n
Bessemer	H2 1 1/2	1995	Co-N	3 1/2x5	B&B	Bak.	LM-7150	DR.	36x3 1/2	36x5
Bessemer	H2 2 1/2	2895	Co-C2	4 1/2x5 1/2	B&B	B-L	LM-7250	DR.	36x4	36x4d
Bessemer	K2 1	3495	Co-E7	4 1/2x5 1/2	B&B	B-L	To-E	IG.	36x5	36x10
Bethlehem	KN 1	1385	Ow.	3 1/2x5	B&B	Det.	Ea-1000	SB.	35x5n	35x5n
Bethlehem	GN 2	2185	Ow.	4x5 1/2	B&B	Det.	Wi-60A	DR.	34x4	34x6
Bethlehem	HN 3	2985	Ow.	4x5 1/2	Ful.	Ful.	Wi-88E	DR.	36x1	36x8
Brookway	E2 1		Wi-SU	1x5	B-L	B-L	Co-5200	SB.	33x5n	33x5n
Brookway	S 1 1/2		Wi-SU	1x5	B-L	B-L	Ti-6460	WO.	36x4	36x6
Brookway	K 2 1/2		Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x4	36x8
Brookway	R 3 1/2		Co-L4	4 1/2x5 1/2	B-L	B-L	Ti-6666	WO.	36x5	36x5d
Brookway	T 5		Co-B5	4 1/2x6	Ow.	Ow.	Ti-6760	WO.	36x6	40x7d
Buck	23 1/4 SD 3 1/2	945	Ow.	3 1/2x4 1/2	Ow.	Ow.	SB.	31x4n	31x4n	
Case	TR 2		Ow.	4 1/2x5 1/2	TD.	Ow.	To-C139	IG.	36x6n	36x7n
Cherriot	Supr 1	575	Ow.	3 1/2x4	Ow.	Ow.	SB.	31x4n	34x4 1/2	
Clyde	10 1 1/2		Co-N	3 1/2x5	B&B	B-L	Ti-5511	SB.	34x5n	34x5n
Clyde	8 1 1/2		Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6460	WO.	36x4	36x7
Clyde	6 3 1/2		Co-L4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x5	36x5d
Clyde	4 1/2		Co-B5	4 1/2x6	B-L	B-L	Ti-6660	WO.	36x6	40x6d
Clyde	2 6 1/2		Co-B5	4 1/2x6	B-L	B-L	Ti-6760	WO.	36x7	40x7d
Commerce	9 1 1/4		Co-N	3 1/2x5	Det.	Det.	SB-D10	SB.	32x4 1/2	32x4 1/2
Commerce	14 1 1/4		Co-J4	3 1/2x5	B-L	B-L	Wi-6560	WO.	36x3 1/2	36x5 1/2
Commerce	25 2 1/2		Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x4k	36x7k
Corbett	S 3 1/2		HS-700	3 1/2x5	B-L	B-L	Sh-100	WO.	34x4 1/2	34x4 1/2
Corbett	E 1		Co-N	3 1/2x5	B-L	B-L	Sh-100	WO.	34x3 1/2	34x4k
Corbett	D 1 1/2		Co-J4	3 1/2x5	B-L	B-L	Sh-150	WO.	34x3 1/2	34x5k
Corbett	C 2		Co-K4	4 1/2x5 1/2	B-L	B-L	Sh-103	WO.	36x3 1/2	36x7k
Corbett	B 2 1/2		Co-L4	4 1/2x5 1/2	B-L	B-L	Sh-21	WO.	36x4	36x8
Corbett	R 3		Co-L4	4 1/2x5 1/2	B-L	B-L	Sh-21	WO.	36x4	36x8
Corbett	A 3 1/4		Co-L4	4 1/2x5 1/2	B-L	B-L	Sh-21	WO.	36x5	36x10
Corbett	AA 5		Co-B5	4 1/2x6	Del.	Del.	Sh-51	WO.	36x6	40x12
Day-Elder	AN 1 1/2		Bu-WTU	3 1/2x5 1/2	B-L	B-L	Ti-6352	WO.	34x3 1/2	34x4
Day-Elder	BN 2		Co-J4	3 1/2x5	B-L	B-L	Ti-6460	WO.	34x3 1/2	34x5
Day-Elder	DN 2 1/2		Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x4	36x7
Day-Elder	CN 3		Bu-HTU	1 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x4	36x8
Day-Elder	FN 4		Co-L4	4 1/2x5 1/2	B-L	B-L	Ti-6666	WO.	36x5	36x5d
Day-Elder	EN 5-6		Bu-YTU	1 1/2x6	B-L	B-L	Ti-6760	WO.	36x5	40x6d
Dearborn	E 1	1800	Bu-MU	3 1/2x5 1/2	Ful.	Ful.	Wi	WO.	35x5n	35x5n
Dearborn	F 1 1/2	1980	Bu-WU	3 1/2x5 1/2	Ful.	Ful.	Wi	WO.	34x4	34x5
Dearborn	48 2	2390	Bu-WU	3 1/2x5 1/2	Ful.	Ful.	Wi	WO.	34x4 1/2	34x7
Defiance	G 1	1525	Co-N	3 1/2x5	B&B	G-L	Ea-1000	SB.	35x5n	35x5n
Denby	31 1 1/4	1485	Co-N	3 1/2x5	Ful.	Ful.	Cl-B300*	SB.	34x5n	34x5n
Denby	33 2	2375	Co-J4	3 1/2x5	Ful.	Ful.	Cl-D	IG.	35x5n	36x7n
Denby	35 3	2975	Co-K4	4 1/2x5 1/2	Ful.	Ful.	Cl-D	IG.	36x4	36x8
Denby	27 4	3695	Co-L4	4 1/2x5 1/2	Ful.	Ful.	Cl-D	IG.	36x5	36x5d
Denby	2105	4295	Co-B5	4 1/2x6	Ful.	Ful.	Cl-D	IG.	36x6	40x6d
Denby	2147	4945	Co-B5	4 1/2x6	Ful.	Ful.	Ru	IG.	36x6	40x14
Dependable	CD 1 1/2	2350	Bu-CTU	3 1/2x5 1/2	Ful.	Ful.	Wi-800J	WO.	34x5	34x8
Dependable	EG 2 1/2	2950	Bu-ETU	4 1/2x5 1/2	Ful.	Ful.	Wi-900C	WO.	36x5	36x10
Diamond T	03 1 1/4		Hi-700	3 1/2x5 1/2	Cov.	Cov.	Ow.	WO.	36x3 1/2	36x4
Diamond T	T 1 1/2		Hi-1400	4 1/2x5 1/2	Cov.	Cov.	Ti-6160	WO.	36x4k	36x5
Diamond T	K 3 1/2		Hi-1500	4 1/2x5 1/2	Cov.	Cov.	Ti-6560	WO.	36x4k	36x8k
Diamond T	EL 5		Hi-200	4 1/2x5 1/2	Cov.	Cov.	Ti-6666	WO.	36x5	36x5d
Diamond T	S 5		Co-B5	4 1/2x6	B-L	B-L	Ti-6760	WO.	36x6	40x6d
Dodge Brothers	3 1/2	730	Ow.	3 1/2x4 1/2	Ow.	Ow.	SB.	32x4n	32x4n	
Doris	K2 1	2490	Ow.	4x5 1/2	Ow.	War.	Ti-5512	IG.	33x5n	33x5n
Doris	K-4 2 1/2	3400	Ow.	4 1/2x5 1/2	Ow.	War.	Ti-6560	WO.	36x4	36x7
Doris	K-7 3 1/2	4400	Ow.	4 1/2x5 1/2	Ow.	War.	Ti-6660	WO.	36x7	36x10
Dori	103 1 1/2	685b	Ly-K	3 1/2x5	Del.	Ow.	Fl-105	SB.	31x4n	31x4n

\*—Make Optional  
 †—Short wheelbase model  
 ‡—6 cylinders  
 §—All 4 cyl. engines unless otherwise specified  
 ††—Truck Tractor  
 ‡‡—Front wheel drive  
 d—price includes body or cab  
 d—dual  
 k—pneumatic tires optional at extra cost  
 n—pneumatic tires standard

**ENGINE:**  
 Bu—Buda  
 Co—Continental  
 Do—Dodge  
 He—Hercules  
 Hi—Hinkley  
 HS—Herschell-Spillman  
 Lx—Lycoung  
 M—Midwest  
 Wa—Waukesha  
 We—Weleley  
 Wi—Wisconsin

**CLUTCH & GEARSET**  
 B&B—Borg & Beck  
 B-L—Brown-Lipe  
 Bak—Baker  
 Cam—Campbell  
 Cot—Corta  
 Cov—Covert  
 Del—Detroit  
 Det—Detroit  
 Ful—Fuller  
 H-S—Hale-Shaw  
 Hoo—Hoosier  
 M&E—Merchant & Evans

**Mec—Mechanics**  
 Mun—Muncie  
 T. D.—Twin Disc  
 War—Warner  
**REAR AXLE:**  
 Am—American  
 Cl—Clark  
 Co—Columbia  
 Du—Durstons  
 Ea—Eaton  
 Fl—Flint  
 LM—L-M

**Ru—Russell**  
 Sa—Sakelton  
 Ti—Timken  
 To—Torbenzen  
 Wa—Walker  
 Wi—Wisconsin  
 Ch—Chain  
 DR—Double Reduction  
 IG—Internal Gear  
 SB—Spiral Bevel  
 SP—Straight Bevel  
 WO—Worm



## Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE		Clutch Make	Gearset Make	REAR AXLE		TIRES	
			Make & Model	Bore & Stroke			Make & Model	Final Drive	Front	Rear
Larrabee...X2	1-1 1/2		Co-SIL	3 3/4 x 4 1/2	B-L	B-L	Sh-1480	SB	34x5n	34x5n
Larrabee...J4	1 1/2		Co-J4	3 3/4 x 5	B-L	B-L	Sh-1501	WO	34x3 1/2	34x5k
Larrabee...K5	2 1/2		Co-L4	4 1/2 x 5 1/2	B-L	B-L	Sh-22	WO	36x4	36x8
Larrabee...L4	3 1/2		Co-L4	4 1/2 x 5 1/2	B-L	B-L	Sh-31	WO	36x5	36x10
Maccar...H2	1 1/2		Co-K4	4 1/2 x 5 1/2	B-L	B-L	Ti-6160	WO	36x4	36x6
Maccar...L2	2 1/2		Co-K4	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x4	36x4d
Maccar...H3	3 1/2		Co-L4	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x4	36x5d
Maccar...M3	4 1/2		Co-L4	4 1/2 x 5 1/2	B-L	B-L	Ti-6666	WO	36x5	36x6d
Maccar...G5-6	5-6		Co-B2	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d
MacDonald...O3-5	3-5	\$5500b	Bu-WTU	3 3/4 x 5 1/2	B-L	B-L	**Own	IG	36x6	36x10
MacDonald...A7 1/2	7 1/2	8800b	Bu-YTU	4 1/2 x 6	B-L	B-L	**Own	IG	40x7	40x14
Mack...AB 1 1/2	1 1/2	3000	Own	4x5	Own	Own	Ch	36x4	36x3 1/2d	36x3 1/2d
Mack...AB 1 1/2	1 1/2	3450	Own	4x5	Own	Own	DR	36x4	36x3 1/2d	36x3 1/2d
Mack...AB 2 1/2	2 1/2	3300	Own	4 1/2 x 5	Own	Own	Ch	36x4	36x4d	36x4d
Mack...AB 2 1/2	2 1/2	3750	Own	4 1/2 x 5	Own	Own	DR	36x4	36x4d	36x4d
Mack...AB 2 1/2	2 1/2	3400	Own	4 1/2 x 5	Own	Own	Ch	36x4	36x4d	36x4d
Mack...AB 2 1/2	2 1/2	3850	Own	4 1/2 x 5	Own	Own	DR	36x4	36x4d	36x4d
Mack...AC 3 1/2	3 1/2	4950	Own	5x6	Own	Own	Ch	36x5	40x5d	40x5d
Mack...AC 3 1/2	3 1/2	5500	Own	5x6	Own	Own	Ch	36x6	40x6d	40x6d
Mack...AC 6 1/2	6 1/2	5750	Own	5x6	Own	Own	Ch	36x6	40x12	40x12
Mack...AC 7 1/2	7 1/2	6000	Own	5x6	Own	Own	Ch	36x7	40x7d	40x7d
Mack...AB 5 1/2	5 1/2	3400	Own	4 1/2 x 5	Own	Own	Ch	36x4	36x4d	36x4d
Mack...AC 7	7	4950	Own	5x6	Own	Own	Ch	36x5	40x5d	40x5d
Mack...AC 10	10	5500	Own	5x6	Own	Own	Ch	36x6	40x6d	40x6d
Mack...AC 13	13	5750	Own	5x6	Own	Own	Ch	36x6	40x12	40x12
Mack...AC 15	15	6000	Own	5x6	Own	Own	Ch	36x7	40x7d	40x7d
Mason...1 1/2	1 1/2	1200	He	4x5	Heo	War	FL	SB	34x5n	34x5n
Master...11 1/2	11 1/2		Bu-WTU	3 3/4 x 5 1/2	Ful	Ful	Ti-5511	SB	33x5n	33x5n
Master...21 1/2	21 1/2		Bu-OU	4 1/2 x 5 1/2	Ful	Ful	Ti-6460	WO	34x4	34x6
Master...41 1/2	41 1/2		Bu-ETU	4 1/2 x 5 1/2	Ful	Ful	Ti-6560	WO	34x4	36x8
Master...51 3/2	51 3/2		Bu-YTU	4 1/2 x 6	B-L	B-L	Ti-6666	WO	36x5	40x10
Master...61 5	61 5		Bu-YTU	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x5	40x12
Master...64 5-6	5-6		Bu-ATU	4 1/2 x 6 1/2	B-L	B-L	Ti-6760	WO	36x6	40x14
Maxwell...1 1/2	1 1/2	932	Own	3 3/4 x 4 1/2	Own	Own	Ti	WO	35x5n	35x5n
Menominee...B1	B1	1650	Wi-SU	4x5	B&B	Det	Co-5200	SB	35x5n	35x5n
Menominee...HT 1 1/2	1 1/2	2000	Wi-FAU	3 3/4 x 5	Ful	Det	Wi-800G	WO	34x3 1/2	36x5k
Menominee...H1 1/2	1 1/2	2475	Wi-EAU	4x5	Ful	Det	Wi-800H	WO	36x3 1/2	36x5k
Menominee...D2 1/2	2 1/2	2875	Wi-TAU	4x6	Ful	Det	Wi-800J	WO	36x4	36x8
Menominee...J5	J5	4850	Wi-RAU	4 1/2 x 6	B&B	Det	Ti-6760	WO	36x6	40x12
Moline...10 1 1/2	10 1 1/2	1695	Own	3 1/2 x 5	B&B	Own	To-A	IG	34x5n	36x8n
Moreland...R.R. 1	1	1595	He-O	4x5	B-L	B-L	Ti-5512	WO	34x5n	34x5n
Moreland...BX 1 1/2	1 1/2	1980	He-O	4x5	B-L	B-L	Ti-6461	WO	36x3 1/2	36x6
Moreland...EX 2	2	2825	Co-K4	4 1/2 x 5 1/2	Own	Own	Ti-6461	WO	36x4	36x8
Moreland...AX 3	3	3500	Co-L4	4 1/2 x 5 1/2	Own	Own	Ti-6560	WO	36x5	36x10
Moreland...RX 5	5	4600	Co-B5	4 1/2 x 6	Own	Own	Ti-6666	WO	36x6	40x12
Nash...2018 1-1 1/2	1-1 1/2	1595	Own	3 3/4 x 5 1/2	B&B	Det	CI-1D	IG	34x4	34x5
Nash...4017F 2-2 1/2	2-2 1/2	2750	Bu-HU	4 1/2 x 5 1/2	B&B	Own	Own	IG	36x6	36x8
Nash...3018 2-2 1/2	2-2 1/2	2150	Own	3 3/4 x 5 1/2	B&B	Det	CI-2D	IG	34x4	34x7
Nash...5018 2-2 1/2	2-2 1/2	2250	Own	3 3/4 x 5 1/2	B&B	Det	CI-2D	IG	34x4	34x7
Noble...A-75 1	1	1395	Bu-WTU	3 3/4 x 5 1/2	Ful	Ful	CI-300	SB	34x4 1/2	34x4 1/2
Noble...A-21 1 1/4	1 1/4	1890	Bu-WTU	3 3/4 x 5 1/2	Ful	Ful	Sh-1501	WO	34x4	34x4 1/2
Noble...B-31 2	2	3795	Bu-CTU	3 3/4 x 5 1/2	Ful	Ful	Sh-103	WO	36x4	36x7
Noble...D-51 2 1/2	2 1/2	3150	Bu-ETU	4 1/2 x 5 1/2	Ful	Ful	Sh-21	WO	36x4	36x8
Noble...E-71 3 1/2-5	3 1/2-5	3850	Bu-YTU	4 1/2 x 6	Ful	War	Sh-30	WO	36x5	36x10
Old Reliable...B 2 1/2	2 1/2	3500	Wi-UAU	4 1/2 x 6	Ful	Ful	Sh-21	WO	34x4	36x8
Old Reliable...C 3 1/2	3 1/2	4250	Wi-UAU	4 1/2 x 6	Ful	Ful	Sh-31	WO	36x5	36x12
Old Reliable...D 5	5	5000	Wi-RAU	4 1/2 x 6	Own	B-L	Sh-51	WO	36x6	40x12
Old Reliable...K 7 1/2	7 1/2	6000	Wa-P	4 1/2 x 6 1/2	Own	Own	Ch	36x6	40x14	40x14
Oldsmobile...T 1	1	1095	Own	3 1/2 x 5 1/2	B&B	War	To-OXL	IG	35x5n	35x5n
Oneida...B 1 1/2-2	1 1/2-2	2825	Hi-400	1 1/2 x 4	Ful	Ful	Wi-800J	WO	36x3 1/2	36x7
Oneida...C 2 1/2	2 1/2	3200	Hi-400	1 1/2 x 4	Ful	Ful	Wi-900C	WO	36x4	36x7
Oneida...D 3 1/2	3 1/2	4050	Hi-200	1 1/2 x 5 1/2	Ful	Ful	Ti-6652	WO	36x5	36x10
Overland...9Ice 1 1/2	1 1/2	425	Own	3 3/4 x 4	B&B	Own	Own	SB	30x3 1/2	30x3 1/2
Patriot, Revere...1	1	1295	Co-N	3 3/4 x 5	B&B	Cov	Own	WO	35x5n	35x5n
Patriot, Lincoln...2	2	2400	Hi-400	1 1/2 x 4	Cov	Ful	Ti-6560	WO	34x4n	34x4n
Pat., Washington...3	3	3080	Hi-200	1 1/2 x 4	Cov	Cov	Wi-900	WO	36x5n	36x8n
Pierce Arrow...XA 2	2	3300	Own	4 1/2 x 5 1/2	Own	Own	Own	WO	36x4	36x4d
Pierce Arrow...XB 3	3	3500	Own	4 1/2 x 5 1/2	Own	Own	Own	WO	36x5	36x5d
Pierce Arrow...WC 4	4	4800	Own	4 1/2 x 6	Own	Own	Own	WO	36x6	36x6d
Pierce Arrow...WD 5	5	4700	Own	4 1/2 x 6 1/2	Own	Own	Own	WO	36x6	40x7d
Pierce Arrow...RE 3	3	5100	Own	4 1/2 x 5 1/2	Own	Own	Own	WO	36x6	40x7d
Pierce Arrow...RF 7	7	5200	Own	4 1/2 x 6 1/2	Own	Own	Own	WO	36x6	40x8d
Rainier...R31 3 1/2	3 1/2		Co-N	3 3/4 x 5	B-L	B-L	Ti-6250	WO	35x5n	35x5n
Rainier...R29 1	1		Co-N	3 3/4 x 5	B-L	B-L	Ti-6250	WO	34x3 1/2	34x4
Rainier...R36 1 1/2	1 1/2		Co-J4	3 3/4 x 5	B-L	B-L	Ti-6468	WO	34x3 1/2	34x5
Rainier...R28 2-2 1/2	2-2 1/2		Co-K4	4 1/2 x 5 1/2	B-L	B-L	Sh-103	WO	34x4	34x7
Rainier...R20 2 1/2-3	2 1/2-3		Co-K4	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x4	36x8
Rainier...R25 3 1/2-5	3 1/2-5		Co-L4	4 1/2 x 5 1/2	B-L	B-L	Ti-6666	WO	36x5	36x5d
Rainier...R27 6	6		Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d
Reo...F 1 1/4	1 1/4	1185	Own	3 1/2 x 4 1/2	Own	Own	Own	SB	34x4 1/2	34x4 1/2
Republic...75 3/4	3/4	1395b	Ly-KB	3 3/4 x 5	Ful	Ful	To-750	IG	33x5n	33x5n
Republic...10E 1	1	1395	Co-N	3 3/4 x 5	Ful	Ful	To-1000	IG	34x5n	34x5n
Republic...11X 1 1/2	1 1/2	1795	Co-J4	3 3/4 x 5	Ful	Ful	To-CT2	IG	34x3 1/2	34x6
Republic...19W 2 1/2	2 1/2		Wa-FU	4x5 1/2	Ful	Ful	To-CT2	IG	36x4	36x7
Republic...19 2 1/2	2 1/2	2195	Co-K4	4 1/2 x 5 1/2	Ful	Ful	To-CT2	IG	36x4	36x7
Republic...20 3 1/2	3 1/2	3995	Co-L4	4 1/2 x 5 1/2	Ful	Ful	To-E	IG	36x5	36x5d
Rowe...CW 1 1/2	1 1/2	3000	Wi-CAU	3 3/4 x 5	B-L	B-L	Sh-1501	WO	36x6n	36x6n
Rowe...CDW 2 1/2	2 1/2	3300	Wi-EAU	3 3/4 x 5	B-L	B-L	Sh-103	WO	36x5	36x3 1/2d
Rowe...CDW 2 1/2	2 1/2		Wi-NU	4x4 1/2	B-L	B-L	Sh-21	WO	34x5	36x4d
Rowe...GSW 3 1/2	3 1/2	4150	Wi-TAU	4x6	B-L	B-L	Sh-21	WO	34x6	36x4d
Rowe...HW 4	4	4500	Wi-UAU	4x6	B-L	B-L	Sh-31	WO	36x6	36x6d
Rowe...FW 5	5	4850	Wi-UAU	4x6	B-L	B-L	Sh-51	WO	36x7	40x6d
Ruggles...15 3/4	3/4	895	HS	3 1/2 x 5	M&E	Ful	Co	SB	32x4 1/2	32x4 1/2
Ruggles...20R 1 1/4	1 1/4	1375	Own	4x5	B-L	B-L	Co-5200	SB	34x5n	34x5n
Ruggles...40 2	2	2095	Own	4x5	B-L	B-L	Wi-65	DR	34x5n	34x7
Ruggles...40H 2 1/2										

## Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	ENGINE					REAR AXLE		TIRES		MAKE AND MODEL	Tons Capacity	ENGINE					REAR AXLE		TIRES	
		Price	Make & Model	Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive	Front	Rear			Price	Make & Model	Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive	Front	Rear
CANADIAN																					
Walter.....N <sup>2</sup>	3600	Own.....	4x5 <sup>3</sup> / <sub>4</sub>	B-L.	B-L.	Own.....	DR.	36x4	36x8	Gotfredson.....20 <sup>3</sup> / <sub>4</sub> -1	1885	Bu-WTU	3 <sup>3</sup> / <sub>4</sub> x5 <sup>5</sup> / <sub>8</sub>	B-L.	B-L.	Ti-6250.	WO.	34x5n	34x5n		
Walter.....S <sup>5</sup>	5100	Own.....	4 <sup>1</sup> / <sub>2</sub> x6 <sup>1</sup> / <sub>2</sub>	B-L.	War.	Own.....	DR.	36x6	40x6d	Gotfredson.....40 <sup>1</sup> / <sub>2</sub> -2	2300	Bu-GTU	4 <sup>1</sup> / <sub>2</sub> x5 <sup>1</sup> / <sub>2</sub>	B-L.	B-L.	Ti-6460.	WO.	36x6n	38x7n		
White.....15 <sup>2</sup> / <sub>4</sub>	2400	Own.....	3 <sup>3</sup> / <sub>4</sub> x5 <sup>1</sup> / <sub>2</sub>	Own.	Own.	Own.....	SP.	34x5n	34x5n	Gotfredson.....50 <sup>1</sup> / <sub>2</sub>	3000	Bu-ETU.	4 <sup>1</sup> / <sub>2</sub> x5 <sup>1</sup> / <sub>2</sub>	B-L.	B-L.	Ti-6560.	WO.	36x4	36x8		
White.....20 <sup>3</sup> / <sub>4</sub>	3250	Own.....	3 <sup>3</sup> / <sub>4</sub> x5 <sup>1</sup> / <sub>2</sub>	Own.	Own.	Own.....	DR.	36x4	36x7d	Gotfredson.....80 <sup>1</sup> / <sub>2</sub>	3975	Bu-YTU	4 <sup>1</sup> / <sub>2</sub> x6	B-L.	B-L.	Ti-6666.	WO.	34x5	36x12		
White.....40 <sup>3</sup> / <sub>4</sub>	4200	Own.....	4 <sup>1</sup> / <sub>2</sub> x5 <sup>3</sup> / <sub>4</sub>	Own.	Own.	Own.....	DR.	36x5	40x5d	Gotfredson.....100 <sup>5</sup> / <sub>8</sub>	4800	Bu-BTU	5x6 <sup>1</sup> / <sub>2</sub>	B-L.	B-L.	Ti-6760.	WO.	36x6	40x14		
White.....45 <sup>5</sup> / <sub>8</sub>	4500	Own.....	4 <sup>1</sup> / <sub>2</sub> x5 <sup>3</sup> / <sub>4</sub>	Own.	Own.	Own.....	DR.	36x6	40x6d	Mapleleaf.....1 <sup>1</sup> / <sub>2</sub>	3000	Hi-300	3 <sup>3</sup> / <sub>4</sub> x5 <sup>1</sup> / <sub>2</sub>	Ful.	Ful.	Sh-1501.	WO.	34x5n	36x6n		
Wilcox.....AA <sup>1</sup>	1900	Bu-CTU	3 <sup>3</sup> / <sub>4</sub> x5 <sup>1</sup> / <sub>2</sub>	B-L.	B-L.	Ru-3600.	SP.	35x5	35x5	Mapleleaf.....AA <sup>2</sup>	3600	Hi-400	4x5 <sup>1</sup> / <sub>2</sub>	Ful.	Ful.	Sh-103.	WO.	36x4	36x7		
Wilcox.....BB <sup>1 1</sup> / <sub>2</sub>	2550	Own.....	4 <sup>1</sup> / <sub>2</sub> x5	B&B.	Own.	Wa-2A.	DR.	36x6k	38x7k	Mapleleaf.....BB <sup>3</sup>	4050	Hi-500	4 <sup>1</sup> / <sub>2</sub> x5 <sup>1</sup> / <sub>2</sub>	Ful.	Ful.	Sh-21.	WO.	36x4	36x4d		
Wilcox.....CC <sup>2 1</sup> / <sub>2</sub>	3000	Own.....	4 <sup>1</sup> / <sub>2</sub> x5	B&B.	Own.	Wa-2A.	DR.	36x6k	40x8k	Mapleleaf.....CC <sup>1</sup>	4800	Hi-200	4 <sup>1</sup> / <sub>2</sub> x5 <sup>1</sup> / <sub>2</sub>	Ful.	Ful.	Sh-31.	WO.	36x5	36x5d		
Wilcox.....EE <sup>3 1</sup> / <sub>2</sub>	3350	Bu-YTU	4 <sup>1</sup> / <sub>2</sub> x6	M&E.	Own.	Wa-5A.	DR.	36x5	36x10	Mapleleaf.....DD <sup>5</sup>	5625	Hi-1600.	4 <sup>1</sup> / <sub>2</sub> x5 <sup>1</sup> / <sub>2</sub>	Ful.	Ful.	Sh-51.	WO.	36x6	36x6d		
Wilcox.....F <sup>5</sup>	4350	Bu-ATU	4 <sup>3</sup> / <sub>4</sub> x6 <sup>1</sup> / <sub>2</sub>	M&E.	Own.	Wa-5A.	DR.	36x5	40x5	National.....FA <sup>1</sup>	2899	Wa-BUX	3 <sup>3</sup> / <sub>4</sub> x5 <sup>1</sup> / <sub>2</sub>	B-L.	B-L.	Ti-6352.	WO.	35x5n	35x5n		
Wilson.....C <sup>1</sup>	1350	He-O.	4 x5	B&B.	Det.	Ti-6532.	WO.	34x5n	34x5n	National.....GA <sup>1 1</sup> / <sub>2</sub>	3699	Wa-BUX	3 <sup>3</sup> / <sub>4</sub> x5 <sup>1</sup> / <sub>2</sub>	B-L.	B-L.	Ti-6460.	WO.	34x4k	34x4k		
Wilson.....F <sup>1 1</sup> / <sub>2</sub>	2270	Co-J4.	3 <sup>3</sup> / <sub>4</sub> x5	B&B.	Cot.	Ti-3490.	WO.	36x3 <sup>1</sup> / <sub>2</sub> k	36x5k	National.....HD <sup>2 1</sup> / <sub>2</sub>	4200	Wa-CU.	4 <sup>1</sup> / <sub>2</sub> x5 <sup>1</sup> / <sub>2</sub>	H-S.	B-L.	Ti-6560.	WO.	36x5	36x10		
Wilson.....EA <sup>2 1</sup> / <sub>2</sub>	2825	Co-K4.	4 <sup>1</sup> / <sub>2</sub> x5 <sup>3</sup> / <sub>4</sub>	B&B.	Cot.	Ti-6560.	WO.	36x4k	36x7k	National.....NB <sup>3 1</sup> / <sub>2</sub>	5395	Wa-DU.	4 <sup>1</sup> / <sub>2</sub> x6 <sup>1</sup> / <sub>2</sub>	H-S.	B-L.	Ti-6666.	WO.	36x7	40x12		
Wilson.....G <sup>3 1</sup> / <sub>2</sub>	3685	Co-L4.	4 <sup>1</sup> / <sub>2</sub> x5 <sup>1</sup> / <sub>2</sub>	B&B.	Cot.	Ti-6660.	WO.	36x5k	36x5dk	National.....OA <sup>5</sup>	2899	Wa-EU.	5x6 <sup>1</sup> / <sub>2</sub>	H-S.	B-L.	Ti-6760.	WO.	36x6	40x14		
Wilson.....H <sup>5</sup>	4520	Co-B2.	4 <sup>3</sup> / <sub>4</sub> x6	B&B.	Cot.	Ti-6752.	WO.	36x6k	40x6dk	Veteran.....M <sup>1 1</sup> / <sub>2</sub>	3699	Bu-CTU	3 <sup>3</sup> / <sub>4</sub> x5 <sup>1</sup> / <sub>2</sub>	B&B.	Cot.	Sh-1501.	WO.	34x5n	34x5n		
Yellow Cab. M22	1590	Co-V4.	3 <sup>3</sup> / <sub>4</sub> x5	B-L.	B-L.	Ti-6752.	SB.	33x4 <sup>1</sup> / <sub>2</sub> n	33x4 <sup>1</sup> / <sub>2</sub> n	Veteran.....P <sup>2</sup>	4200	Bu-HTU	4 <sup>1</sup> / <sub>2</sub> x5 <sup>1</sup> / <sub>2</sub>	B&B.	Cot.	Sh.	WO.	36x4	36x7		
Yellow Cab. M42	1640	Co-V4.	3 <sup>3</sup> / <sub>4</sub> x5	B-L.	B-L.	Ti-6352.	WO.	35x5n	35x5n	Veteran.....R <sup>3</sup>	5395	Bu-HTU	4 <sup>1</sup> / <sub>2</sub> x5 <sup>1</sup> / <sub>2</sub>	B&B.	Cot.	Sh-21.	WO.	36x1	36x7		
										Veteran.....S <sup>4</sup>		Bu-YTU	4 <sup>1</sup> / <sub>2</sub> x6	B&B.	Cot.	Sh-31.	WO.	36x5	36x10		

## Current Tractor Specifications

MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plovs	ENGINE				Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (Ins.)	MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plovs	ENGINE				Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (Ins.)	MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plovs	ENGINE				Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (Ins.)
			Make	No. of Cyls. Bore & Stroke	Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (Ins.)						Make	No. of Cyls. Bore & Stroke	Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (Ins.)						Make	No. of Cyls. Bore & Stroke	Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (Ins.)		
Allis-Chalmers.....6-12	1	3295	LeR.	4-3 1/2 x 4 1/2	2500	48x 6	Gray.....DU	18-36	4	2150	Wau.	4-3 1/2 x 6 1/2	6200	Rumely OilPull.....30-60	8-10	1	Own.	2-10x12	26700	80x30						
Allis-Chalmers.....15-25	3	1185	Mid.	4-4 1/2 x 5 1/2	4700	48x12	Gray.....EU	22-40	4	2385	Wau.	4-5 x 6 1/2	6900	Russell.....15-30	3-4	1	Chl.	4-5 x 6 1/2	6000	56x14						
Allis-Chalmers.....20-35	4	1885	Own.	4-4 1/2 x 6 1/2	6150	50x12	Hart-Parr.....20	-20	2	Own.	2-5 1/2 x 6 1/2	4438	46x10	Russell.....20-40	4-5	1	Chl.	4-5 x 7	7900	60x16						
Allis-Chalmers.....30-38	5	1695	Own.	4-5 x 7	6500	48x14	Hart-Parr.....30	-30	3	Own.	2-6 1/2 x 7	5220	52x10	Russell.....30-60	8-10	1	Own.	4-8 x 10	22550	84x22						
Allis-Chalmers.....40-48	6	1495	Own.	4-4 1/2 x 6 1/2	4800	48x12	Hart-Parr.....Road	-30	3	Own.	2-6 1/2 x 7	7560	52x18	Shaw-Enoch (Gr.).....30-45	4	1	LeR.	4-3 1/2 x 4 1/2	4400	48x 8						
Allis-Chalmers.....50-55	7	1295	Own.	4-5 x 6	5200	48x12	Heider.....D	9-16	2	Wau.	4-4 1/2 x 6 1/2	4000	54x 8	Topp-Stewart.....6-10	2	1	Wau.	4-4 1/2 x 6 1/2	7800	42x12						
Adman-Taylor.....15-30	3-4	1900	Chl.	4-5 x 6 1/2	7800	70x12	Heider.....C	12-20	3	Wau.	4-4 1/2 x 6 1/2	6000	57x10	Toro.....10-20	2-3	1	LeR.	4-3 1/2 x 4 1/2	2900	41x 9						
Adman-Taylor.....22-45	4-6	3100	Own.	4-5 1/2 x 8	12500	70x20	Heider.....M	5-10	1	LeR.	4-3 1/2 x 4 1/2	2800	46x 6	Townsend.....10-20	2-3	1	Own.	2-6 1/2 x 7	4500	48x12						
Adman-Taylor.....30-60	8-10	1400	Own.	4-7 x 9	22500	90x24	Huber.....(Light 4)	12-25	3	985	Wau.	4-4 1/2 x 6 1/2	5000	60x10	Townsend.....15-30	3-4	1	Own.	2-7 x 8	6500	56x18					
Avery.....15	3-4	1500	Own.	4-4 1/2 x 6	4750	50x12	Huber.....(Super 4)	15-30	3	850	Mid.	4-4 1/2 x 6	6000	60x10	Townsend.....25-50	4-8	1	2500	Own.	2-8 1/2 x 10	11500	60x24				
Avery.....20-35	4-5	2000	Own.	4-4 1/2 x 7	7500	60x16	LaCrosse.....M	6-12	1	500	Own.	2-4 x 6	3000	48x 7	Traylor.....6-12	1	1	500	LeR.	4-3 1/2 x 4 1/2	1750	38x10				
Avery.....25-50	5-6	2500	Own.	4-6 1/2 x 7	12500	69x20	LaCrosse.....H	12-24	3	850	Own.	2-6 x 7	3800	56x10	Twin City.....12-20	3	1	1200	Own.	1-4 1/2 x 6	4550	50x12				
Avery.....45-65	8-10	3500	Own.	4-7 1/2 x 8	22000	87 1/2 x 24	Lauson.....S	12-25	3	375	Mid.	4-4 1/2 x 5 1/2	4200	50x12	Twin City.....20-35	5	1	2750	Own.	4-5 1/2 x 6 1/2	8100	60x20				
Avery, Tr. Runner	3	1500	Own.	4-4 x 5 1/2	5000	x 8 1/2	Lauson.....T	15-30	4	375	Bea.	4-4 1/2 x 6	6200	50x12	Twin City.....40-60	8	1	4750	Own.	4-7 1/2 x 9	23700	84x24				
Avery, RoadRazer	3	1500	Own.	6-3 x 4	4600	42x 6	Leader.....B	12-18	2	375	Own.	2-6 1/2 x 6	4800	50x12	Uncle Sam.....C-20	12-20	2-3	990	Her.	4-4 x 5	3000	46x12				
Bates (St. Mule) H	15-25	3	Mid.	4-4 1/2 x 5 1/2	3600	48x10	Leader.....N	16-32	3-4	1275	Chl.	4-5 x 6	5800	52x12	Uncle Sam.....B-19	20-30	3-4	1535	Bea.	1-4 1/2 x 6	4650	50x12				
Bates (St. Mule) F	18-25	3	Mid.	4-4 1/2 x 5 1/2	4850	*56x10	Leader.....GU	16-32	3-4	1275	Chl.	4-5 x 6	5800	52x12	Uncle Sam.....D-21	20-30	3-4	1485	Bea.	1-4 1/2 x 6	4600	50x12				
Bates (St. Mule) G	25-35	4	Mid.	4-4 1/2 x 6	6500	x10	Lincoln.....A	15-30	3	1600	Bud.	4-4 1/2 x 6	5000	40x11	Wallis.....OK	15-27	3	Own.	4-4 1/2 x 5 1/2	3660	48x12					
Bates (St. Mule) 40	30-40	4	Mid.	4-4 1/2 x 6	8500	*84x10	Little Giant.....B	16-22	4	Own.	4-4 1/2 x 6	5200	54x14	Waterloo Boy.....N	12-25	3	Own.	2-6 1/2 x 7	5869	52x12						
Best.....B	25-35	4	Ste.	4-4 1/2 x 6	9000	*64x12	Little Giant.....A	26-35	6	Own.	4-5 1/2 x 6	8700	66x20	Wetmore.....12-25	3	1	1185	Wau.	4-4 x 5 1/2	2900	46x10					
Best.....30	20-30	4	Own.	4-4 1/2 x 6	8100	*68x11 1/2	Lombard.....100	12-16	1	Own.	6-5 1/2 x 7	19000	x12	Wisconsin.....16-30	3-4	1	1750	Chl.	4-5 x 6 1/2	5600	52x12					
Best.....60	10-60	9	Own.	4-6 1/2 x 8	18500	*89x20	London.....12-25	3	785	Mid.	4-4 1/2 x 5 1/2	48x12	Wisconsin.....22-40	4-5	1	2550	Chl.	4-5 x 7	5750	52x12						
Best.....Steam	15-30	3	2500	Own.	2-4 x 5	5500	52x12	McCork-Deering.....10-20	2	785	Own.	4-4 1/2 x 5	3700	42x12	Yuba (Ball Tread).....15-25	4	1	2750	Wis.	4-4 x 6	5750	*36x12				
Case.....12-20	2	3	1095	Own.	4-4 1/2 x 5	4230	42x12	McCork-Deering.....15-30	3	1250	Own.	4-4 1/2 x 6	5750	50x12	Yuba (Ball Tread).....25-40	8	1	4500	Own.	4-5 1/2 x 7	10130	*48x17 1/2				
Case.....15-27	15-27	3-4	1350	Own.	4-4 1/2 x 6	6600	52x14	Minneapolis.....12-25	3	1250	Own.	4-4 1/2 x 6	6600	56x12												
Case.....22-40	22-40	4-5	2650	Own.	4-5 1/2 x 7	10700	56x16	Minneapolis.....17-30	3-4	1250	Own.	4-4 1/2 x 7	6100	54x12												
Case.....40-72	40-72	8-10	4900	Own.	4-7 x 8	21200	72x20	Minneapolis.....22-44	4-5	1250	Own.	4-6 x 7	12410	62x20												
Caterpillar.....2 Ton	15	3	1975	Own.	4-4 x 5 1/2	4000	*	Minneapolis.....35-70	8-10	1250	Own.	4-7 1/2 x 9	22500	85x30												
Caterpillar.....5 Ton	25	4	3975	Own.	4-4 1/2 x 6	9400	*	Moline (Un.).....D3	9-8	2-3	725	Own.	4-3 1/2 x 5	4103	52x 8											
Caterpillar.....10 Ton	40	6	6050	Own.	4-6 1/2 x 7	19500	*	Moline (Orc.).....D	9-8	2-3	725	Own.	4-3 1/2 x 5	3893	44x 8											
Cletrac.....F	9-16	2	845	Own.	4-3 1/2 x 4 1/2	1930	*42x 5 1/2	Monarch.....E	20-30	4	3800	Bea.	4-4 1/2 x 6	8700	*66x12											
Cletrac.....W	12-20	2	1345	Own.	4-4 x 5 1/2	3455	*48x 8	Monarch.....E	25-40	4	5000	Bea.	4-4 1/2 x 6	12000	*67x12											
Engle.....F	12-22	3	Own.	2-7 x 8	5850	48x12	Monarch.....D	35-60	6	6000	Bea.	6-8 x 10	15000	*89x12	Centaur.....1923	2 1/2-5	1	395	Own.	1-3 1/2 x 3 1/2	750	28x 4				
Engle.....H	16-30	4	Own.	2-8 x 8	7100	48x12	Nichols-Shepherd.....20-42	4-6	2600	Own.	2-8 x 10	13500	64x20	Do-It-All.....(Jack)	2 1/2-6	1	495	Own.	1-4 1/2 x 5	800	26 1/2 x 3 1/2					
E.B.....AA	12-20	3	Own.	4-4 1/2 x 5	4550	54x12	Nichols-Shepherd.....25-50	6-8	3320	Own.	2-9 x 12	20500	69x28	Do-It-All.....(Baby)	2 1/2-6	1	495	Own.	2-3 1/2 x 3 1/2	1200	32x 4					
E.B.....Q	12-20	3	Own.	4-4 1/2 x 5	6500	60x12	Nichols-Shepherd.....35-70	8-12	4030	Own.	2-10x14	23000	73x32	Kinkade.....1 1/2-3	1	190	Own.	1-3 x 3	180	22 1/2 x 6 1/2						
Faguel.....19-12	2	1175	Lyc.	4-3 1/2 x 5	3600	48x 8 1/2	Pioneer.....C	18-36	4	Own.	4-5 1/2 x 6	6500	60x18	M.B.M. Red.....E	1-4 1/2	1	250	Own.	1-3 1/2 x 4	410	20 x 3					
Fordson.....18	2	395	Own.	4-4 x 5	2562	42x12	Pioneer.....C	40-75	10	Own.	4-7 x 8	24000	96x24	Motor Maculivator.....2	6	1	148	Own.	1-2 1/2 x 3 1/2	210	19 1/2 x 3 1/2					
Frick.....A	12-20	2	1000	Erd.	4-4 x 6	5800	60x10	Rumely OilPull.....10-25	3	Own.	2-6 x 8	6682	51x12	N.B.....501	2 1/2-4	1	375	Own.	2-2 1/2 x 4	750	32 x 4					
Frick.....15-28	3	1800	Bea.	4-4 1/2 x 6	6730	60x12	Rumely OilPull.....16-30	4	Own.	2-7 x 8 1/2	9600	56x16	Utilitor.....501	2 1/2-4	1	295	Own.	1-3 1/2 x 4 1/2	750	24 1/2 x 4 1/2						
							Rumely OilPull.....20-40	6	Own.	2-8 x 10	12820	64x20	Utilitor.....501A	2 1/2-4	1	340	Own.	1-3 1/2 x 4 1/2	925	24 1/2 x 4 1/2						

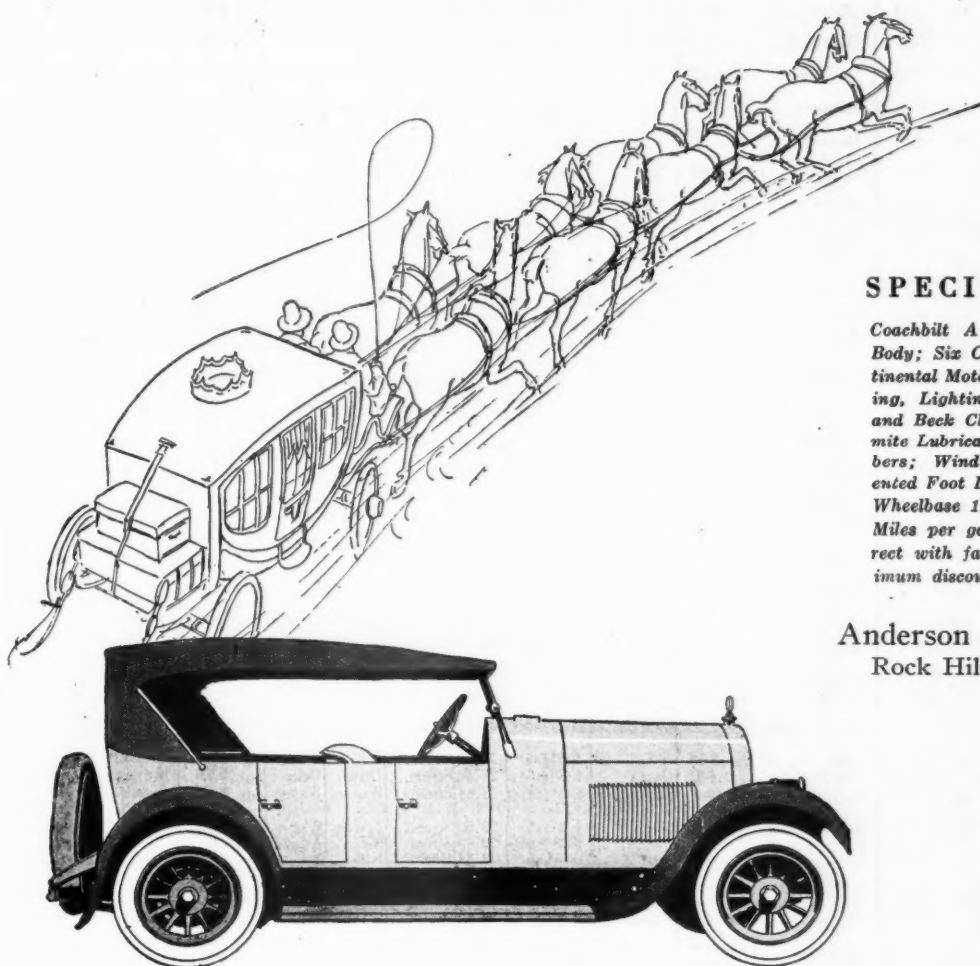


# Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

PRICES						Wheel Base (Ins.)	Tire Size (Ins.)†	NAME AND MODEL	ENGINE				ELECTRICAL SYSTEM		Clutch, Type and Make	Gearset Make	Universal: Type and Make	REAR AXLE			
OPEN MODELS			CLOSED MODELS						Make and Model	No. of Cyls. Bore and Stroke	Horse Power Rating (N.A.A.C.)	Carburetor Make	Generator and Starter Make	Ignition Make				Type and Make	Type and Make		
2-3 Pass.	4-5 Pass.	6-7 Pass.	Sport Models	2-3 Pass.	4-5 Pass.	6-7 Pass.															
\$1950c	\$1785	\$1850	\$1835c	\$2250	\$2485		127	33x4 1/2	American.....D-66	11-8. 11000	6-3 1/2 x 5	29.40	Strom.	G-D.	A-K.	s-p	B&B.	B & B.	m Hart...	F Salis.	4.30
	1195		1305c		1495		114	32x4	Anderson.....41	Cont...6 Y	6-3 1/2 x 4 1/2	23.44	Zenith.	West.	s-p	B&B.	Durston.	f Univ...	3/4 F Salis.	4.30	
1405	1495	1595	1785b	1905c	1995d		122	32x4	Anderson.....Series 51	Cont...8 R	6-3 1/2 x 4 1/2	27.31	Rayfield.	Remy.	Remy.	s-p	B&B.	Durston.	f Univ...	3/4 F Salis.	4.40
	1535		1915c		2200		132	33x4	Anderson.....Series 50	Cont...8 R	6-3 1/2 x 4 1/2	27.31	Rayfield.	Remy.	Remy.	s-p	B&B.	Durston.	f Univ...	3/4 F Salis.	4.40
	2800	2900			3750		120	32x4	Apperson.....	Own.....	6-3 1/2 x 4 1/2	23.44	Strom.	Remy.	Remy.	s-p	Rock.	Mech.	m Thie...	3/4 F Col.	4.30
	1165		1275d		1535	\$3850	130	33x5	Apperson.....8-23-S	(Own.....	8-3 1/2 x 5	33.80	Johnson.	Bijur.	Remy.	m-d	Own.	Own.	m Thie...	3/4 F Col.	4.30
	1725		1985d		2045		114	31x4	Auburn.....6-43	Cont...6 Y	6-3 1/2 x 4 1/2	23.44	Strom.	Remy.	Remy.	s-p	B&B.	Warner.	m Detr.	3/4 F Col.	4.40
					2345		122	32x4 1/2	Auburn.....6-63	Own.....	6-3 1/2 x 5	25.35	Strom.	Remy.	Remy.	s-p	B&B.	Warner.	m Thie...	3/4 F Col.	4.40
	1395			1495d	1850		118	32x4	Barley.....	Cont...6 Y	6-3 1/2 x 4 1/2	23.44	Strom.	Delco.	Delco.	s-p	B&B.	Fuller...	f M&E.	3/4 F Col.	5.10
	885	885	725g	1025b	1175		109	31x4	Buick.....34-5-6-7-8-39	Own.....	4-3 1/2 x 4 1/2	18.23	Marvel.	Delco.	Delco.	m-d	Own.	Own.	m Own.	3/4 F Own.	4.40
	1175	1195	975e		1935		118	32x4	Buick.....41-4-5-47	Own.....	6-3 1/2 x 4 1/2	27.34	Marvel.	Delco.	Delco.	m-d	Own.	Own.	m Own.	F Own.	4.10
		1435	1625a		1895	2195	124	33x4 1/2	Buick.....48-9-50-4-55	Own.....	6-3 1/2 x 4 1/2	27.34	Marvel.	Delco.	Delco.	m-d	Own.	Own.	m Own.	F Own.	1.70
2835	2885	2885		3075c	3950	4300g	132	33x5	Cadillac.....61	Own.....	8-3 1/2 x 5 1/2	31.25	Own.	Delco.	Delco.	m-d	Own.	Own.	m Spicer.	F Tim.	5.00
					3750	3990															
1750	1790		2230d	2480c	2575	2840	122	32x4 1/2	Case.....X	Cont...8 R	6-3 1/2 x 4 1/2	27.34	Rayfield.	Delco.	Delco.	m-d	Own.	Own.	f Sneed	3/4 F Col.	4.40
	1185	1235	1385d		2480	2975	129	34x4 1/2	Case.....W	Cont...6 T	6-3 1/2 x 4 1/2	25.35	Rayfield.	Delco.	Remy.	m-d	Own.	Own.	m Hardy	3/4 F Adams.	5.10
		1315			1585		117	32x4	Chalmers.....1923	Own.....	6-3 1/2 x 4 1/2	25.35	Strom.	A-L.	Remy.	m-d	Own.	Own.	m Hardy	3/4 F Adams.	5.10
1595	1485	1635	1785c		2195		122	32x4	Chalmers.....1923	Own.....	6-3 1/2 x 4 1/2	25.35	Strom.	A-L.	Remy.	m-d	Own.	Own.	f Own.	F Own.	4.40
	1685				2385		123	32x4	Chandler.....Six	Own.....	6-3 1/2 x 5	29.40	Strom.	Bosch.	Bosch.	s-p	B&B.	Own.			
					2995g																
510	525	425g		680	860		103	30x3 1/2	Chevrolet.....Superior	Own.....	4-3 1/2 x 4	21.70	Zenith.	Remy.	Remy.	e	Own.	Own.	m Own.	3/4 F Own.	3.70
					850																
1035	995		1095d	1195	1295		112 1/2	31x4	Cleveland.....42	Own.....	6-3 1/2 x 4 1/2	22.50	Strom.	Bosch.	Bosch.	s-p	B&B.	Own.	m Mech.	3/4 F Own.	4.40
			1260d	1495d	1595p																
	2175	2175		2750c	3075	3075	127 1/2	33x5	Cole.....Master	Nort.M309	8-3 1/2 x 4 1/2	39.20	Johnson.	Delco.	Delco.	m-d	Nort.	Nort.	m Spicer.	F Col.	4.70
	1475			1925c	1995		115	32x4	Columbia.....Big Six	Cont...8 R	6-3 1/2 x 4 1/2	27.34	Strom.	A-L.	A-K.	s-p	B&B.	Durston.	m Spicer.	3/4 F Tla.	4.30
955c	1135		1395d	1295	1465		115	31x4	Columbia.....Light Six	Cont...6 Y	6-3 1/2 x 4 1/2	23.44	Strom.	A-L.	A-L.	s-p	B&B.	Durston.	m Spicer.	3/4 F Tla.	5.10
	1095				1685																
1395p	1295		1505c	1495	2195p	1895	110	32x4	Courier.....	Falls. 8000	6-3 1/2 x 4 1/2	23.44	Strom.	West.	A-K.	s-p	B&B.	Muncie.	f Flexite	3/4 F Col.	5.10
	3100	3130		3500c	4500	4500	138	33x4 1/2	Crawford.....23-6-70	Cont...6 T	6-3 1/2 x 5 1/2	31.54	Zenith.	West.	Bosch.	m-d	B-L.	B-L.	m Spicer.	3/4 F Tim.	4.20
					4500		138	33x4 1/2	Crawford-Dagmar.....6-70	Cont...6 T	6-3 1/2 x 5 1/2	31.54	Zenith.	West.	Bosch.	m-d	B-L.	B-L.	m Spicer.	3/4 F Tim.	4.20
	5800	6300		7650	7650		142	33x5	Cunningham.....V4	Own.....	8-3 1/2 x 5	45.00	Strom.	Delco.	Delco.	m-d	Own.	Own.	f Sneed.	F Tim.	4.20
5000	4650	4700	4650c		6350	6450	132	33x5	Daniels.....23-38	Own.....	8-3 1/2 x 5 1/2	39.20	Zenith.	Delco.	Delco.	m-d	Own.	Own.	m Spicer.	F Tim.	4.20
		4800			5600																
	5000	5150		6000c	6600	6800	132	33x5	Daniels.....23-38	Own.....	8-3 1/2 x 5 1/2	39.20	Zenith.	Delco.	Delco.	m-d	Own.	Own.	m Spicer.	F Tim.	4.20
1295	1495		1495c		1595	1795c	115	31x4	Davis.....71	Cont...7 U	6-3 1/2 x 4 1/2	23.44	Strom.	Delco.	Delco.	s-p	B&B.	Warner.	m M&E.	3/4 F Tim.	5.10
1595	1595		1095d	2095	1995		120	32x4 1/2	Davis.....63	Cont...8 R	6-3 1/2 x 4 1/2	27.34	Strom.	Delco.	Delco.	s-p	B&B.	Warner.	m Peters	3/4 F Tim.	5.10
850	880			980	1440		111	32x4	Dodge Brothers.....	Own.....	4-3 1/2 x 4 1/2	24.03	Stewart.	N.E.	N.E.	s-p	Own.	Own.	m Own.	3/4 F Own.	4.40
				1195																	
	3950	3950	4150c	4935c	5550*	5800*	136	33x5	Dorris.....6-80	Own.....	6-4 x 5	38.40	Strom.	West.	Bosch.	m-d	Own.	Warner.	m Spicer.	3/4 F Tim.	4.20
870	885		995c	1240	1350		108	31x4	Dort.....23-18	Own.....	4-3 1/2 x 5 1/2	19.60	Carter.	Bosch.	Comm.	m-d	Det.	Own.	m Mech.	3/4 F Flint.	4.40
1010	1025		1135c	1355	1465		115	31x4	Dort.....25-20	Falls T8000	6-3 1/2 x 4 1/2	23.44	Carter.	Bosch.	Comm.	m-d	Det.	Own.	m Mech.	3/4 F Flint.	4.40
5750	5500	5900	5750c	7250	7500	131	33x5	Duesenberg.....Straight 8	Own.....	8-2 1/2 x 5	26.45	Strom.	Delco.	Delco.	s-p	Own.	Own.	f Clinax.	3/4 F Own.	4.40	
890	890		1065d	1305	1365		109	31x4	Durant.....A-22	Cont. Spec	4-3 1/2 x 4 1/2	24.03	Till.	A-L.	A-L.	s-p	Own.	Warner.	m Spicer.	3/4 F Adams.	4.30
				1465																	
1000	1650		2250	2400			123 1/2	32x4 1/2	Durant.....B-22	Anst...D	6-3 1/2 x 4 1/2	25.35	Rayfield.	A-L.	A-L.	s-p	Anst.	Warner.	m f Spicer.	3/4 F Tim.	5.15
1485	1095		1275d	1395c	1595		112	32x4	Earl.....40	Own.....	4-3 1/2 x 5 1/2	18.91	See.	A-L.	Comm.	s-p	B&B.	Own.	f Own.	3/4 F Own.	4.40
	995		1135	1425	1425		112	31x4	Elcar.....4-40	Lye.....K	4-3 1/2 x 5	21.03	Strom.	Delco.	Delco.	s-p	B&B.	Warner.	m Peters.	3/4 F Salis.	4.40
1395	1395		1595d	1975	1995		118	32x4	Elcar.....6-60	Cont...7 R	6-3 1/2 x 4 1/2	27.31	Strom.	Delco.	Delco.	m-d	War.	Warner.	m Spicer.	3/4 F Salis.	4.40
	1045			1115	1115		108 1/2	32x4	Essex.....	Own.....	4-3 1/2 x 5	18.23	Own.	Bosch.	Bosch.	m-d	Own.	Own.	m Spicer.	3/4 F Adams.	4.40
1195	1195		1195	1895c	1895		120	32x4 1/2	Flint.....	Cont. Spec	6-3 1/2 x 5	27.34	Strom.	DeJon.	DeJon.	s-p	Own.	Warner.	m Spicer.	3/4 F Adams.	4.40
269	298a	235g		530	595		100	30x3 1/2	Ford.....T	Own.....	4-3 1/2 x 4	22.50	Own.	Own.	Own.	m-d	Own.	Own.	m Own.	3/4 F Own.	3.60
				725																	
2975	2975		3975	3975	3975		132	32x4 1/2	Fox.....Air-Cooled	Own.....	6-3 1/2 x 5	27.34	Zenith.	West.	Sciutilla	m-d	B-L.	B-L.	m Spicer.	3/4 F Tim.	4.40
	1950		2750c	2750	2750	\$2350d	115	32x4	Franklin.....10	Own.....	6-3 1/2 x 4	25.35	Own.	A-K.	A-K.	s-p	B&B.	Own.	m Spicer.	3/4 F Own.	4.70
			2850d	2850																	
995	995		1145c	1145	1415		112	32x4	Gardner.....Series 5	Lye.....CE	4-3 1/2 x 5	21.70	Zenith.	West.	West.	s-p	B&B.	Mech.	m Peters.	3/4 F Flint.	4.40
490	520			750	835		100	30x3 1/2	Gray.....	Own.....	4-3 1/2 x 4	21.03	See.	West.	West.	s-p	Own.	Own.	m Mech.	3/4 F Tim.	3.80
				785																	

# Unmatched Value



## SPECIFICATIONS

Coachbilt Anderson Aluminum Body; Six Cylinder, Red Seal Continental Motor; Westinghouse Starting, Lighting and Ignition; Borg and Beck Clutch; Cord Tires; Alemite Lubrication; Motometer; Snubbers; Wind Shield Cleaner; patented Foot Dimmer for Headlights; Wheelbase 115 inches. Average 19 Miles per gallon of gas—and a direct with factory contract at maximum discount.

Anderson Motor Company  
Rock Hill, South Carolina

The Coachbilt  
**ANDERSON**  
ALUMINUM SIX

only  
**\$1195**  
f. o. b. Rock Hill, S. C.



# Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

PRICES										NAME AND MODEL		ENGINE		ELECTRICAL SYSTEM			Clutch Type and Make	Gearset Make	Universal Type and Make	REAR AXLE	
OPEN MODELS			CLOSED MODELS			Wheel Base (Ins.)	Tire Size (Ins.)	Make and Model	No. of Cyls. Bore and Stroke	Horse Power Rating (N.A.A.C.)	Carburetor Make	Generator and Starter Make	Ignition Make	Type and Make	Gear Ratio						
2-3 Pass.	4-5 Pass.	6-7 Pass.	2-3 Pass.	4-5 Pass.	6-7 Pass.											NAME AND MODEL	Make and Model	No. of Cyls. Bore and Stroke	Horse Power Rating (N.A.A.C.)	Carburetor Make	Generator and Starter Make
\$2385	\$1885	\$2385	\$2385c	3375	3075	124	32x4 1/2	Kissel.....45	Own.....	6-3 1/2x5 1/2	26.38	Strom.	Remy.	Remy.	m-d War.	Warner.	m Spicer.	F Own.	3.92		
5000	5000	5000	4200c	6300	6500	132	33x5	LaFayette.....	Own.....	8-3 1/2x5 1/2	33.80	Johnson.	Delco.	Delco.	m-d Own.	Own.	m Own.	F Own.	4.58		
1795	1795	1795	2145d	2345	2345	123	32x4 1/2	Lexington.....23	Anst.....C	6-3 1/2x4 1/2	25.35	Rayfield.	G-D.	Conn.	m-d Own.	Warner.	f Sneed.	F Salis.	5.10		
1575	1395	.....	1575	2085	2245	117	32x4	Liberty.....10-D	Own.....	6-3 1/2x5	23.44	Strom.	Wagner	Wagner	s-p B&B.	Detroit.	m Spicer.	1/2 F Tim.	4.80		
3800	3800c	3800	4600c	4400	4900	136	33x5	Lincoln.....	Own.....	8-3 3/4x5	36.45	Strom.	Delco.	Delco.	m-d Own.	Own.	m Spicer.	F Tim.	4.58		
8900	9500c	9600	.....	11750	11600	142	35x5	Locomobile.....Series 8	Own.....	6-4 1/2x5 1/2	48.60	Ball&B.	West.	Delco.	m-d Own.	Own.	m Own.	F Own.	3.85		
3385	3185	3185	.....	4385	4385	136	32x4 1/2	Marmen.....34	Own.....	6-3 1/2x5 1/2	33.75	Strom.	Delco.	Delco.	m-d Own.	Own.	m Spicer.	3/4 F Own.	4.10		
885	885	.....	975b	1235	1625d	109	31x4	Maxwell.....	Own.....	4-3 1/2x4 1/2	21.03	Stewart.	Remy.	Remy.	c Own.	Own.	f Own.	1/2 F Own.	1.60		
5400	5600	5700	6720	6800	6810	140	33x5	McFarlan.....1923	Own.....	6-4 1/2x6	48.60	Rayfield.	West.	West.	n-d M&E.	B-L.	m Peters.	F Tim.	3.75		
3950b	3750c	3950c	3950c	4850	5250	132	32x4 1/2	Mercer.....Series 5	Own.....	4-3 1/2x6 1/2	22.50	Ball&B.	West.	Eisem.	m-d Own.	Own.	m Spicer.	F Own.	3.87		
1695	1695	.....	3750c	5000	.....	132	32x4 1/2	Mercer.....6	Own.....	6-3 1/2x5	33.75	Strom.	West.	Eisem.	m-d Own.	Own.	m Spicer.	3/4 F Own.	3.77		
1295	1295	.....	1495d	1695	.....	119	32x4	Merit.....	Cont.....8 R	6-3 1/2x4 1/2	27.34	Strom.	Delco.	Delco.	s-p B&B.	Muncie.	f Sneed.	F Col.	4.62		
.....	.....	.....	1585c	1895	.....	115	31x4	Moon.....6-40	Cont.....6 Y	6-3 1/2x4 1/2	23.41	Strom.	Delco.	Delco.	s-p B&B.	Warner.	m Spicer.	1/2 F Tim.	5.19		
.....	1785	1995c	.....	2585	2485	128	32x4 1/2	Moon.....6-58	Cont.....8 R	6-3 1/2x4 1/2	27.31	Strom.	Delco.	Delco.	s-p B&B.	B-L.	m Spicer.	1/2 F Tim.	5.09		
1240	1240	.....	1645c	2090	.....	121	33x4	Nash.....691-3-6-7	Own.....	6-3 1/2x5	25.35	Marvel.	Delco.	Delco.	s-p B&B.	Own.	m Own.	1/2 F Own.	4.50		
915	935	1390	.....	1890	2190	127	34x4 1/2	Nash.....692-4-5-8	Own.....	6-3 1/2x5	25.35	Marvel.	Delco.	Delco.	s-p B&B.	Own.	m Own.	1/2 F Own.	4.90		
.....	.....	1195d	.....	1445	.....	112	33x4	Nash.....41-8	Own.....	4-3 1/2x5	18.23	Marvel.	Delco.	Delco.	s-p B&B.	Own.	m Own.	1/2 F Own.	1.88		
2475	2475c	2375	2485d	3250	3285	130	32x4 1/2	National.....BB	Own.....	6-3 1/2x5 1/2	29.40	Rayfield.	West.	Delco.	s-p B&B.	B-L.	m Univ.	F Col.	1.06		
2500	2500c	2600c	.....	3500	.....	128	33x5	Noma.....4C	Cont.....8 R	6-3 1/2x4 1/2	27.34	Zenith.	Delco.	Delco.	s-p B&B.	Detroit.	m Spicer.	1/2 F Tim.	4.45		
975	995	795g	1165c	1185	1545	115	32x4	Oakland.....6-44	Own.....	6-2 1/2x4 1/2	18.99	Marvel.	Remy.	Remy.	c Own.	Muncie.	m Mech.	F Own.	4.70		
975	975	.....	1145a	1445	.....	115	32x4	.....	Oldsmobile.....43 A	Own.....	4-3 1/2x5 1/2	21.86	Zenith.	Delco.	Delco.	s-p B&B.	Muncie.	m Own.	3/4 F Own.	1.70	
1625p	1375	1735	1675c	1875	2025	122	33x4 1/2	Oldsmobile.....46	Own.....	8-2 1/2x4 1/2	26.45	Ball&B.	Delco.	Delco.	c Own.	Muncie.	m Spicer.	F Own.	1.93		
525	525	.....	425c	795	860	115	32x4	Oldsmobile.....47	Own.....	8-2 1/2x4 1/2	26.45	Johnson.	Delco.	Delco.	s-p B&B.	Muncie.	m Own.	3/4 F Own.	5.10		
.....	750	.....	.....	100	30x3 1/2	106	30x3 1/2	Overland.....91	Own.....	4-3 1/2x4	18.23	Till.	A-L.	A-L.	s-p B&B.	Own.	m Own.	1/2 F Own.	4.50		
.....	.....	.....	.....	106	30x3 1/2	106	30x3 1/2	Overland.....92	Own.....	4-3 1/2x4	19.60	Till.	A-L.	A-L.	s-p B&B.	Own.	m Own.	1/2 F Own.	4.50		
2485	2485	.....	2650c	3175c	3350d	126	33x4 1/2	Packard.....126	Own.....	6-3 1/2x5	27.31	Own.	A-K.	Delco.	m-d Own.	Own.	m Spicer.	1/2 F Own.	1.66		
3850	3650	.....	4550c	4725	4700f	136	33x5	Packard.....133	Own.....	6-3 1/2x5	27.31	Own.	A-K.	Delco.	m-d Own.	Own.	m Spicer.	1/2 F Own.	1.66		
2695	2450	2450	.....	4900f	4950f	143	33x5	Packard "Eight".....136	Own.....	8-3 1/2x5	36.45	Own.	Dyneto.	Delco.	m-d Own.	Own.	m Spicer.	1/2 F Own.	4.70		
.....	.....	.....	.....	3225	3235	131	33x4 1/2	Packard "Eight".....143	Own.....	8-3 1/2x5	36.45	Own.	Dyneto.	Delco.	m-d Own.	Own.	m Spicer.	1/2 F Own.	4.70		
1550	1390	1425	1465d	2395	2395	120	32x4 1/2	Paige.....6-70	Own.....	6-3 1/2x5	33.75	Rayfield.	Remy.	A-K.	m-d Long.	Warner.	m Mech.	1/2 F Tim.	4.60		
3300	2990	2990	.....	3300	3400	128	33x5	Paterson.....23-6-52	Cont.....8 R	6-3 1/2x4 1/2	27.34	Strom.	Delco.	Delco.	s-p B&B.	Durston.	m Hart.	1/2 F Salis.	1.90		
5250	5250	5250	.....	3300	3400	128	33x5	Peerless.....23	Own.....	8-3 1/2x5	33.80	Ball&B.	Delco.	Delco.	m-d Own.	Own.	m Spicer.	1/2 F Tim.	4.90		
.....	1695	1745	1745	2445	2495	126	32x4 1/2	Pierce-Arrow.....	Own.....	6-4 x5 1/2	38.40	Own.	Delco.	Delco.	m-d Own.	Own.	m Spicer.	1/2 F Own.	4.29		
2535	2535	2585d	2635d	.....	3385	3585	126 1/2	32x4 1/2	Pilot.....6-50	H-S.....90	6-3 1/2x5	25.35	Till.	Wagner	Wagner	s-p Hoos.	Muncie.	m Blood.	3/4 F Col.	1.67	
1095	1095	.....	1750	1825	.....	117	32x4	Premier.....6-D	Own.....	6-3 1/2x5 1/2	27.34	Strom.	Delco.	Delco.	s-p B&B.	Own.	m Spicer.	1/2 F Own.	1.88		
.....	1665	.....	2385c	2475	.....	116	32x4	Premocor.....6-40-A	Falls.....XP	6-3 1/2x4 1/2	23.44	Strom.	Wagner	Wagner	s-p B&B.	Mech.	m Spicer.	3/4 F	5.09		
3200c	3200	.....	3200c	.....	4000	.....	131	32x4 1/2	R & V Knight.....R	Own.....	4-3 1/2x5	22.50	Strom.	Wag.	Wag.	s-p B&B.	B-L.	m Spicer.	F Salis.	1.75	
2685	2485	2685	2750c	.....	3500	3700	124	32x4 1/2	R & V Knight.....H	Own.....	6-3 1/2x5	29.40	Strom.	A-L.	A-L.	s-p B-L.	B-L.	m Spicer.	1/2 F Tim.	5.40	
.....	1615	1485	1645	1855c	1885	2185d	120	32x4	Reo.....T6	Own.....	6-3 1/2x5	24.34	Rayfield.	N.E.	N.E.	m-d Own.	Own.	m Own.	1/2 F Own.	1.70	
3200c	3200	.....	3200c	.....	4000	.....	131	32x4 1/2	Revere.....M	Dues.....	6-4 1/2x6	30.63	Strom.	West.	Bosch.	m-d B-L.	B-L.	m Spicer.	3/4 F Stand.	3.44	
2685	2485	2685	2750c	.....	3585	3585d	128	32x4 1/2	Rickenbacker.....B	Own.....	6-3 1/2x4 1/2	23.44	Strom.	Bosch.	Bosch.	s-p Own.	Warner.	m Mech.	3/4 F Col.	4.63	
3685	3485	3800	3650c	.....	4250p	4000f	138	32x4 1/2	Roamer.....6-54-E	Cont.12XD	6-3 1/2x5 1/2	29.40	Strom.	West.	Split.	s-p B&B.	G-L.	f Sneed.	1/2 F Tim.	4.60	
3785	3485	3800	3650c	.....	4450p	3950	128	32x4 1/2	Roamer.....4-75-E	Roch.....	4-4 1/2x6	28.90	Strom.	West.	Split.	m-d B-L.	B-L.	f Sneed.	1/2 F Tim.	4.08	
10900	10900	10950	.....	12800	12850	143 1/2	33x5	Rolls-Royce.....40-50	Own.....	6-4 1/2x4 1/2	48.60	Own.	Bijur.	Bosch.	c Own.	Own.	m Own.	F Own.	3.25		
.....	1615	1615	.....	5100	5200	118	32x4	Rubay.....	Own.....	4-2 1/2x5 1/2	12.10	Strom.	Bosch.	Bosch.	s-p Own.	Own.	m Univ.	F Own.	5.10		
1645	1615	.....	2615d	2615	.....	118	33x4	Sayers Six.....DP	Cont.....8 R	6-3 1/2x4 1/2	27.34	Strom.	Delco.	Delco.	s-p B&B.	G-J.	m Arvac.	1/2 F Stand.	4.75		
875	875	.....	.....	.....	.....	108	30x3 1/2	Seneca.....L-2 & O-2	Lyc.....KB	4-3 1/2x5	19.60	Zenith.	A-L.	A-L.	s-p B&B.	G-L.	m Univ.	F Peru.	4.75		
985	985	.....	.....	.....	.....	112	31x4	Seneca.....50c & 51c	Lyc.....KB	4-3 1/2x5	21.03	Zenith.	A-L.	A-L.	s-p B&B.	G-L.	m Univ.	F Peru.	4.80		
.....	2500	2500c	.....	3300	3400	127	34x4 1/2	Standard.....99	Own.....	8-3 1/2x5	33.80	Zenith.	West.	Split.	s-p B&B.	G-L.	m Arvac.	1/2 F Tim.	4.45		
2750	2750	2750	2425g	.....	3585	3985	130	32x4 1/2	Stanley.....740	Own.....	2-4 x5	.....	None.	Bijur.	None.	None.	None.	None.	1/2 F Own.	1.50	
3119	3485	285g	580	645	.....	102	30x3 1/2	Star.....	Cont. Spec	4-3 1/2x4 1/2	15.63	Till.	A-L.	A-L.	s-p Own.	Warner.	m Spicer.	1/2 F Tim.	4.87		
2250	2250	2450	2275c	.....	3150	3450	125	34x4 1/2	Stearns-Knight.....SKL4	Own.....	4-3 1/2x5 1/2	22.50	Rayfield.	West.	A-K.	m-d Own.	Own.	f Climax.	1/2 F Own.	4.50	
2700	2700	2850	2700c	3350c	3500	4500f	130	34x4 1/2	Stearns-Knight.....6	Own.....	6-3 1/2x5	27.34	Rayfield.	West.	A-K.	m-d Own.	Own.	f Climax.	1/2 F Own.	4.70	
1445	1395	.....	1695d	1995	.....	117	32x4	Stephens.....10	Own.....	6-3 1/2x4 1/2	25.35	Strom.	Delco.	Delco.	s-p B&B.	Mech.	m Mech.	1/2 F Tim.	5.10		
2045	1745	2145c	.....	2385	.....	124	33x4 1/2	Stephens.....20	Own.....	6-3 1/2											

# BADGER

*Passenger Car - Commercial Car*

# TIRES

Many attractive features serve to make the Badger Tire proposition a desirable one:—

High quality of the product; stability of its makers; competitiveness of the line; permanency of supply; territorial sales protection and unusually liberal profits.

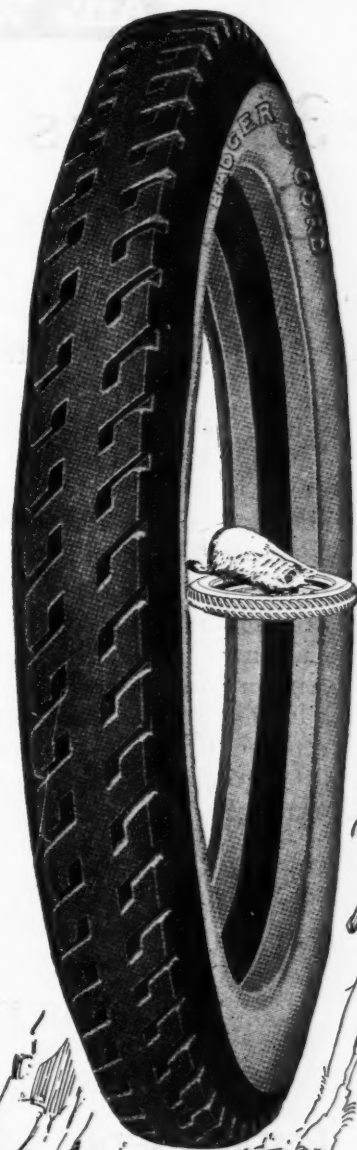
In fact there is no better line or proposition than offered in Badger, and its steadily increasing sales are the best proof of that fact.

The line is complete in types and sizes whether for Passenger or Heavy Duty Car, Speed Wagon or Bus.

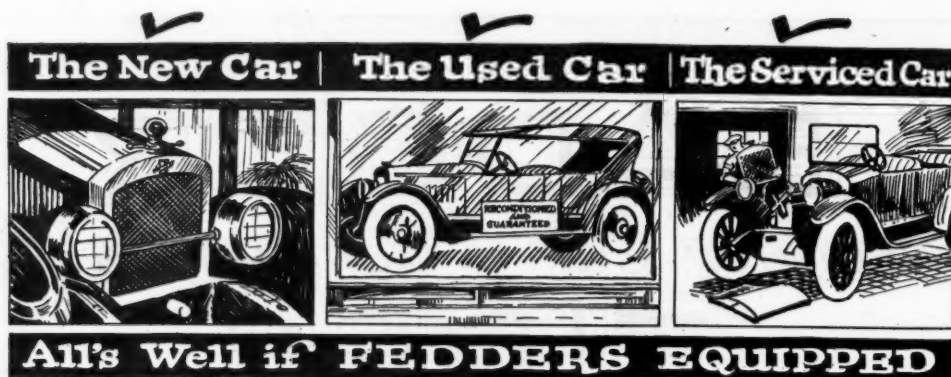
Distributed through accredited Jobbers only. Full information on request.

**THE BADGER RUBBER WORKS**

*Milwaukee, Wisconsin*







## 3 Ways for Dealers to Cash in On the FEDDERS Reputation

### 1. On the New Car

If the car or truck you're selling is equipped with a FEDDERS Radiator, you have in that fact alone a strong selling argument. Since the beginning of the industry the name FEDDERS has been linked with Cars and Trucks of Quality. And to-day the new FEDDERS Shallow Cores represent the latest advance in automotive radiator practice.

### 2. On the Used Car

To install one of the new FEDDERS Shallow Cores on a Used Car is to make that car, so far as its radiator is concerned, better than new. It is easily and quickly done and will add sufficiently to the car's resale value to bring you a comfortable profit. It is also a strong talking point in selling the car.

### 3. On the Serviced Car

Every car coming in for service, with a damaged radiator, is an opportunity to do your customer a service, make an additional profit, and enhance your reputation, by installing a new Fedders Shallow Core. For that core to-day embodies the highest cooling efficiency known to automotive radiator practice. And it is freeze-proof and clog-proof.

*Write us for full details regarding these new Shallow Cores. It may be that you are in position to act as our representative in your territory. If so we should be glad to take this up with you if that territory is not already filled.*

**FEDDERS MFG. CO., Inc., Buffalo, N. Y.**

**(CATALOGED)**  
*in the Red Directory*

BALTIMORE  
Enterprise Auto  
Repair Works,  
1908-12  
Frederick Ave.

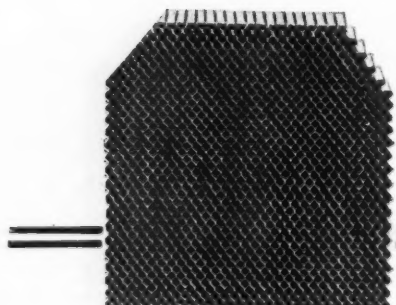
CLEVELAND  
Fedders Mfg. Co.,  
3610  
Superior Ave.

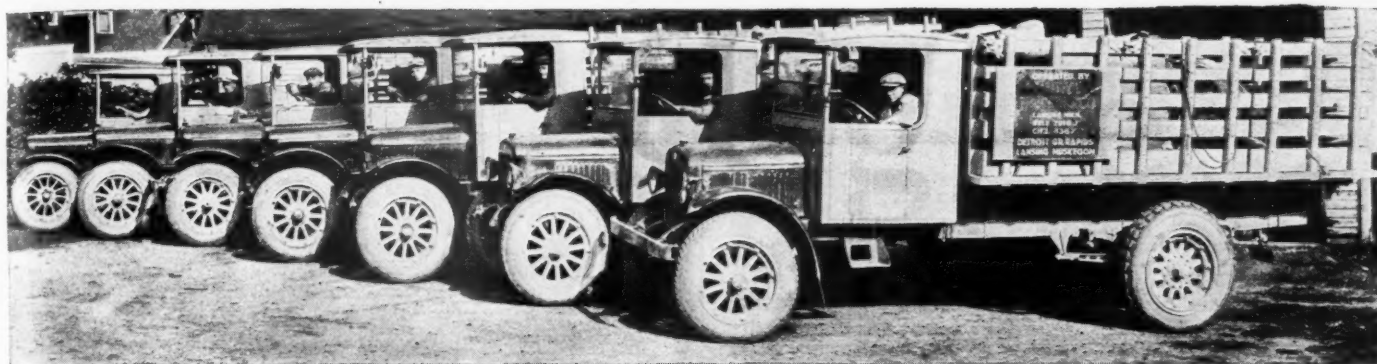
DETROIT  
Olympian Radiator  
Repair Co.,  
1981  
Grand River Ave.

INDIANAPOLIS  
Seth Klein  
Radiator Co.,  
820 North  
Meridian St.

NEW YORK  
Henry  
Jelinek Co., Inc.,  
364-366  
West 50th St.

SAN  
FRANCISCO  
Feldmans Auto  
Metal Works,  
76 Eighth St.





## Ruggles Dealers Pile Up Sales Throughout the Country

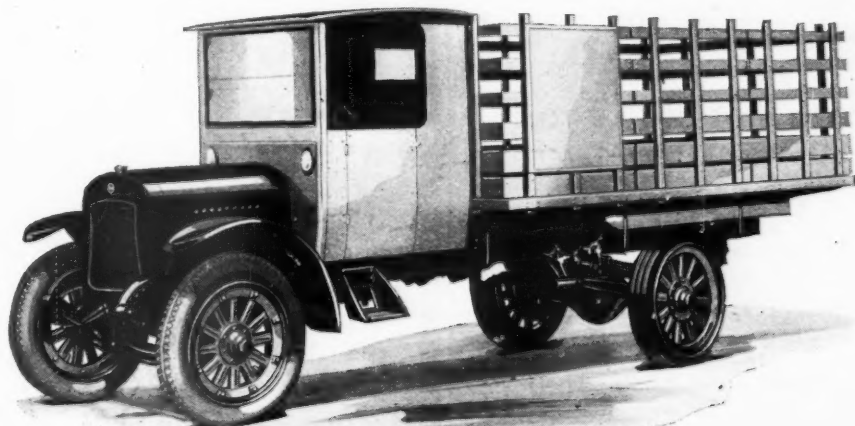
Sales in single units and in fleets prove to dealers the money-making power of a Ruggles franchise. New dealers are constantly awaking to the opportunity and asking for territory.

The Ruggles dealer sells a quality job that justifies his most enthusiastic sales talk. Engine, clutch, transmission, axle—every part is equal or superior to those in trucks costing much more than the Ruggles.

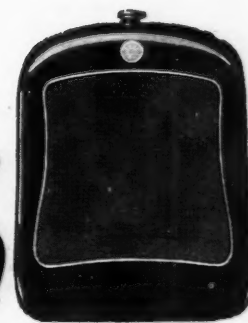
Five models ranging from 1,500 to 5,000 lbs. capacity, and two special bus models give the Ruggles dealer a complete line that meets every demand. He is in a position to dominate the motor truck trade of his territory.

If you can sell high-grade trucks at attractive prices, write us for details of the Ruggles franchise.

RUGGLES MOTOR TRUCK COMPANY, *Saginaw, Mich.*  
*Canadian Factory: Ruggles Motor Truck Company, Ltd., London, Ontario*



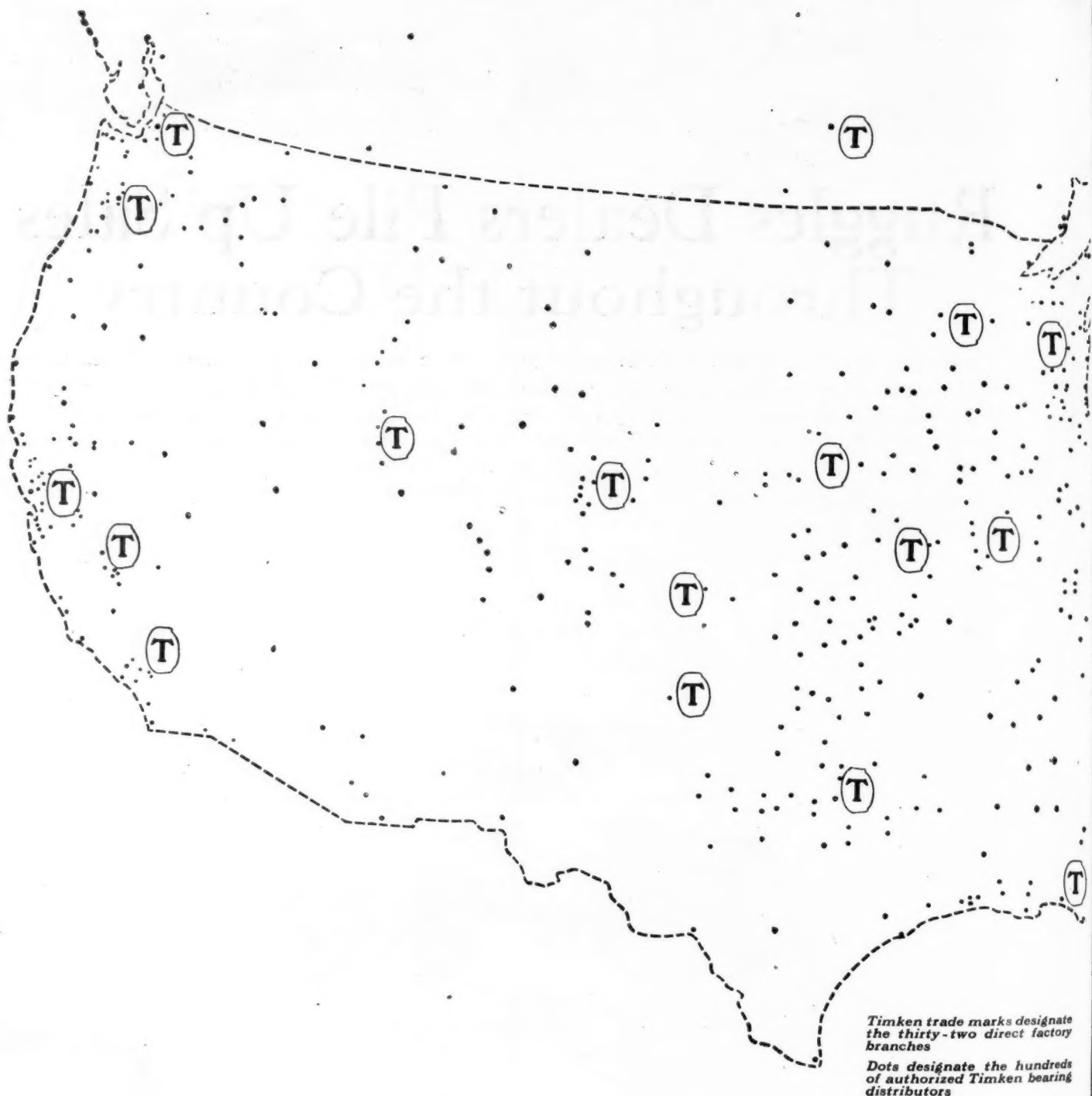
# RUGGLES



*The World's Greatest Truck Value*

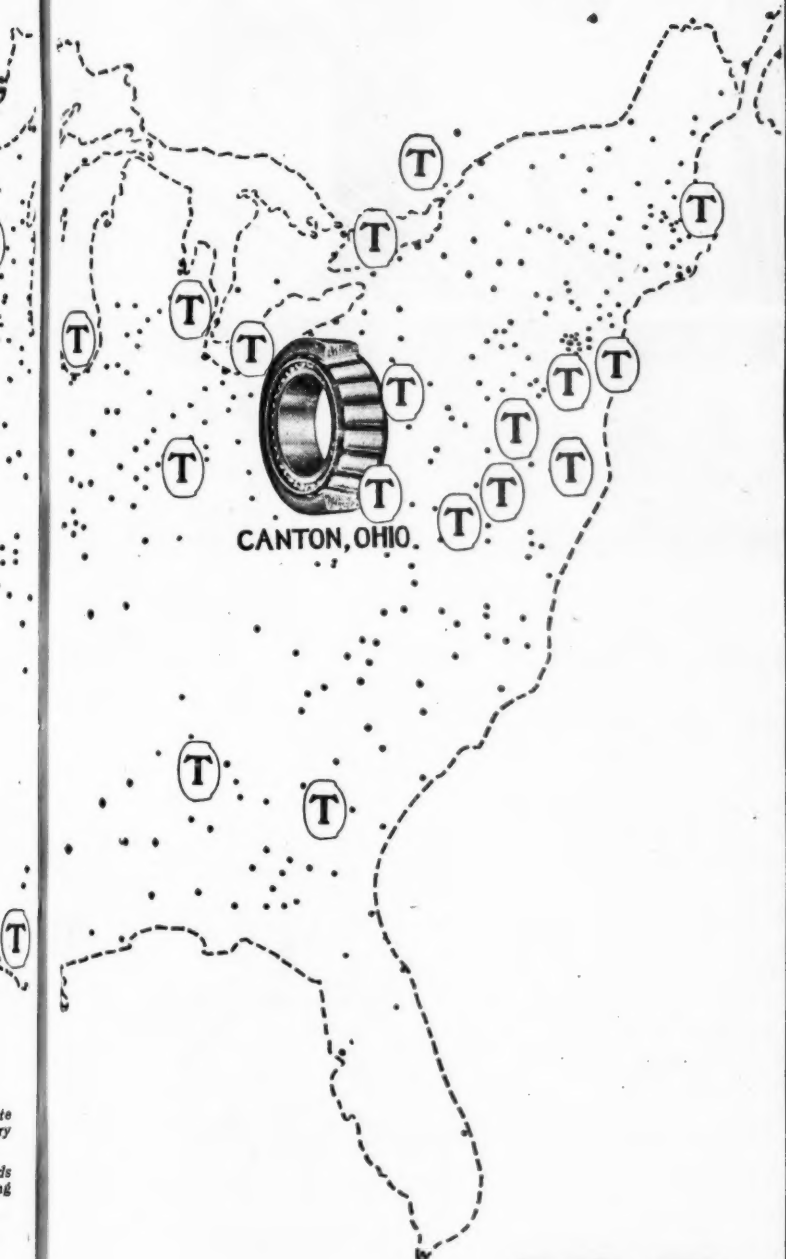


# B l a n k



***You Are Never Farther From a Timken Bearing Than Your Telephone***

# Market Age!



The Timken Bearing organization, shown here, parallels in magnitude, forcefulness, and completeness the overwhelming demand for and dominance of Timken Bearings themselves.

Throughout the world, wherever there is power to be conserved, millions upon millions of Timken Tapered Roller Bearings have been installed, year after year, until today more than 83,000,000 Timken Bearings in motor cars, motor trucks, tractors, power-driven farm implements, trailers, machine tools, industrial trucks, conveying machinery, mine cars, ventilating machines, and hundreds of other industrial applications are "Fighting Friction Everywhere".

A product functioning daily—so importantly—in so many phases of life naturally establishes its builders as a national institution of marked importance.

**The Timken Roller Bearing Co**  
CANTON, OHIO



**The Timken Roller Bearing**  
Service & Sales Company

**BRANCHES:**

Atlanta  
Baltimore  
Birmingham  
Boston  
Brooklyn  
Buffalo  
Chicago  
Cleveland  
Dallas  
Denver  
Detroit

Fresno  
Indianapolis  
Kansas City  
Los Angeles  
Milwaukee  
Minneapolis  
Newark  
New Orleans  
New York  
Oklahoma  
City

Omaha  
Philadelphia  
Pittsburgh  
Portland  
Richmond  
St. Louis  
Salt Lake City  
San Francisco  
Seattle  
Toronto  
Winnipeg

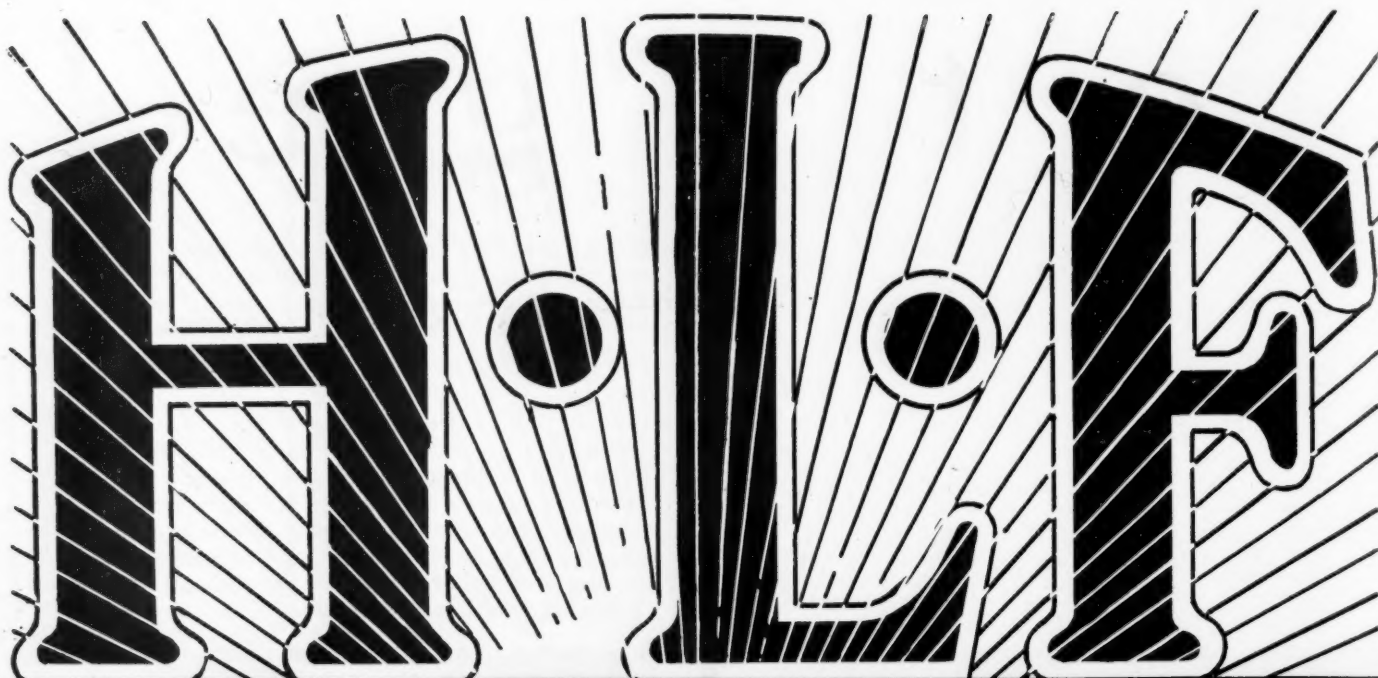
*Distributors Everywhere*

# TIMKEN

*Tapered*

# ROLLER BEARINGS





# High Lustre Finish

*For Everything Varnished or Enamelled*

## The Automobile Cleaner That Made Good The Best Way

H L F has achieved a national reputation on merit alone. Without an advertising campaign, without an intensive forced-pressure sales effort, without all the so-called essentials to putting a product across to the consumer H L F has reached a broad and constantly widening distribution from coast to coast.

H L F has established itself, by sheer merit, as a moving line—a standard product with a standard and constantly increasing consumer demand.

H L F cleans while it works, gives a sparkling, lustrous finish—in one quick, easy operation. Restores the car's original beauty. Dries hard and glossy. Leaves no dust-collecting film. This is consumer experience in every State.

Put your time and your effort only into those products that establish themselves as steady repeaters. H L F is one of them.

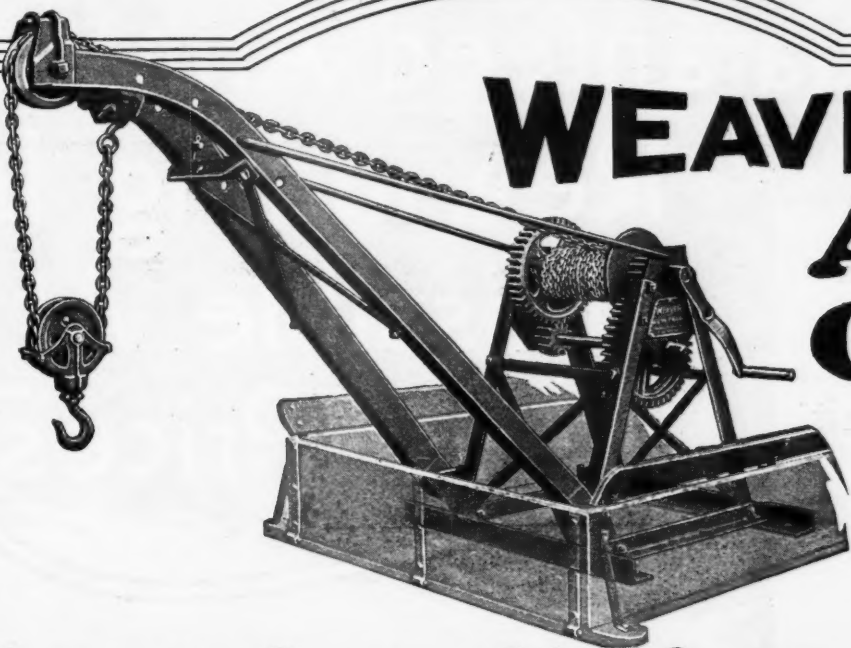
*Sold exclusively through Jobbers  
who are fully protected*

**H. L. FEASEL'S LABORATORY**  
9-11-13 DESBROSSES STREET  
NEW YORK CITY

*Friendly comments alone have sold H L F. These will be supplemented by brief and convincing advertisements in THE SATURDAY EVENING POST, beginning in August*

Genuine H L F is in the  
Oval Bottle with Black  
and White Checkered  
Label





# WEAVER

## Auto-Crane

### Get your share of towing profits now

**M**ORE cars are on the road now than at any other season of the year. Now is the time to reap the harvest of profits that a quick, efficient towing service is sure to bring to your shop. Mount a Weaver Auto Crane on your service car and go out after the business. No need to worry about paying for it, because it will pay for itself.

Insist on getting a Weaver Auto Crane. It alone has all of the following necessary features.

Moderate price.

Drum mounted on roller bearings greatly facilitates operation and reduces wear.

Compound gear construction affords two distinct leverages. For quick adjustment of the chains to the load, the lower auxiliary shaft is used. When greater power is needed the crank is applied to the upper shaft, which greatly increases the leverage and permits the heaviest passenger cars to be handled with ease.

Crank can be conveniently operated from either side of Crane while mechanic is standing on the ground or service car.

One man can readily adjust boom to desired height. By blocking chain, this can be done while burden is suspended.

Twenty-six feet of highest grade chain furnished. Drum ample to accommodate without overlapping 40 feet of cable which will be supplied in place of chain when so ordered.

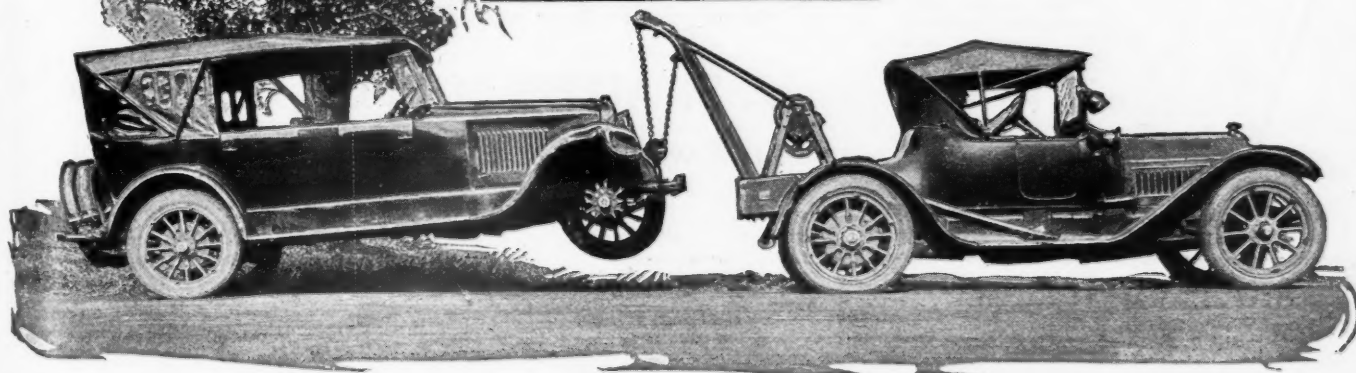
*Special literature on the Auto Crane and booklet describing our entire line of garage equipment—they're yours for the asking.*

## WEAVER MANUFACTURING CO.

Springfield, Illinois, U. S. A.  
Weaver Canadian Co., Ltd., Chatham, Ont.



*The best equipped shop gets the business*





# Why Guaranteed Armature Rewinding Is Possible At These Prices

Ford Armature  
Rewound \$2.00

Any Two Unit  
Generator  
Armature  
Rewound  
\$5.00

Look for the  
Yellow Band

Every armature re-  
wound by us carries this  
band on which is print-  
ed our positive guaran-  
tee that the armature will  
give the same service as  
a new one.



Send for this  
Booklet

It contains many inter-  
esting facts and valua-  
ble information about  
armature rewinding. Also  
contains complete price  
lists. Send for a free  
copy.

We are able to quote these prices and issue an iron-clad guarantee with every armature we rewind because of the large volume of business we handle in this line. The men in our armature service division are specialists in this one thing. They are thoroughly trained along this line and as a result they work with accuracy and speed. Thus our production costs are held to a minimum. This makes possible our attractive prices.

Bear in mind that these prices are for *guaranteed* work. If any armature rewound by us is not absolutely satisfactory in every way we make an adjustment immediately and without question. Our adjustment cases, however, are very few for the same reason mentioned above—our men are so thoroughly trained and are so expert in their line that the quality of their work is very high.

We maintain a stock of over 6,000 armatures for exchange purposes. Rewound armatures—absolutely guaranteed—will be shipped to you the same day we receive the defective armatures from you.

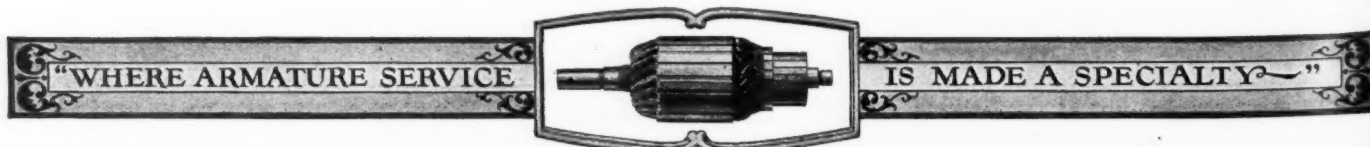
Send us your work or write for complete price lists.

## U. S. AUTO SUPPLY COMPANY

Armature Service Division

3845 S. Wabash Ave.,

Chicago, U. S. A.



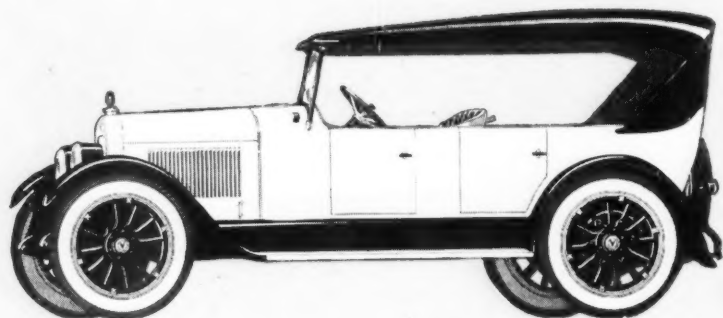


**Have your sales fallen off?  
Are you making the profit  
you ought to make?**

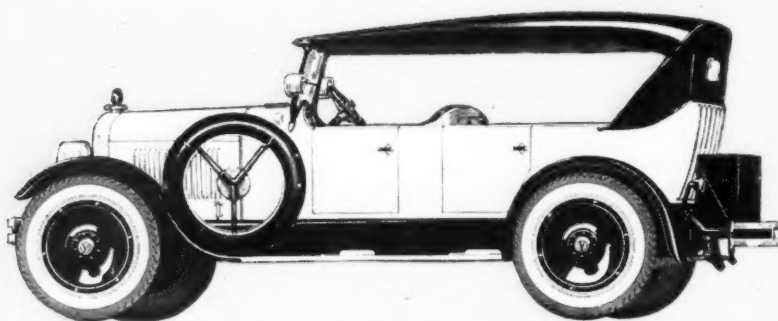
Dealers enrolled under the Velie franchise in 1923-4 will make more money than they ever made before. A letter on your letterhead will bring you the reasons why.



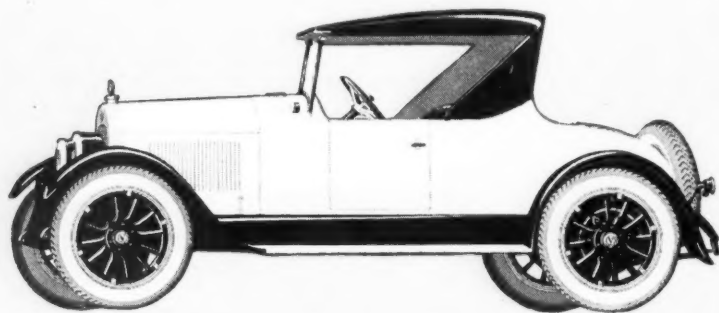
# THIS IS THE *That backs up*



Velie Model 58, five-passenger Touring; beautifully finished and equipped; all Velie cars are powered with the remarkable vibrationless six-cylinder, valve-in-head Velie-built motor.



Velie Model 58, five-passenger Sport; equipment includes two extra cord tires, disc wheels, bumpers, spotlights, trunk, two suitcases, hat box, and many other items.



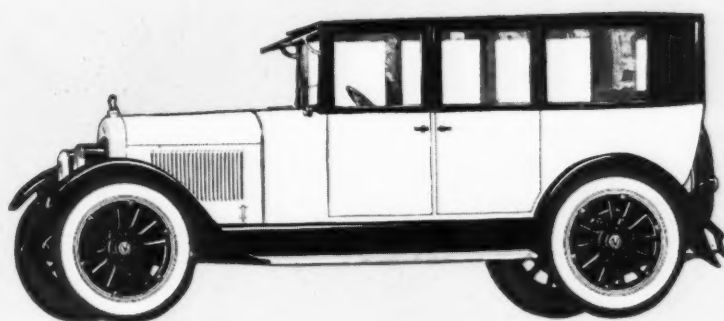
Velie Model 58, three-passenger Roadster. We also build a Sport Roadster, specially painted, with extra cord tire, disc wheels, bumpers, spotlights.

*Seven choice and distinctive body styles, whose coachwork and finishing alone requires twenty-eight days to complete—offering to every prospective customer the car precisely adapted to his needs.*

*One chassis, the famous Velie 58, riding on long, underslung semi-elliptic springs and powered by the remarkable valve-in-head motor—automatically lubricated, even to the piston pins—which Velie engineers adapted from the aeroplane.*

# VALUE LINE

## *the Velie Dealer*



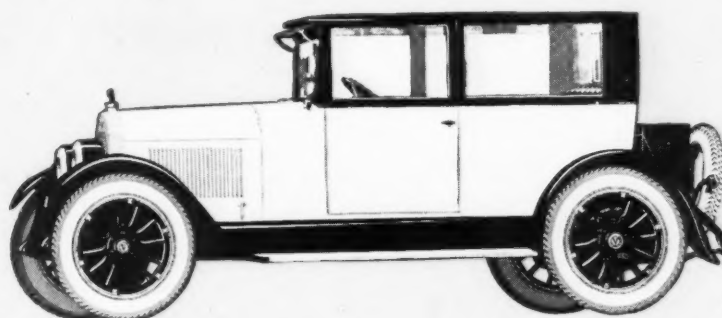
Velie Model 58, five-passenger Sedan; all Velie enclosed cars are upholstered in a choice grade of taupe mohair velvet, with carpets and trimming of harmonizing color.

*This Velie-built motor has no counterpart except in cars of the very highest price. It is at least two years in advance of other engine designs in its price class.*

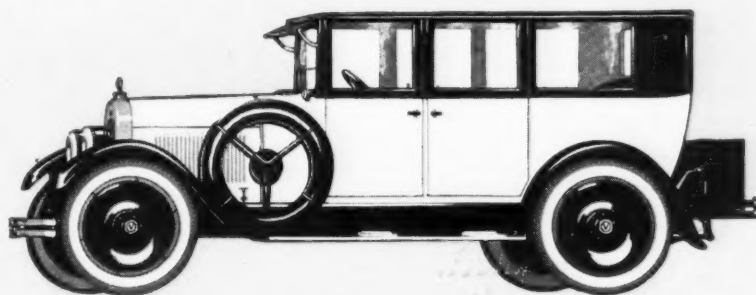
*Its power is a source of unending wonder, whether on level or hill or on the get-away in crowded traffic.*

*The Model 58 is amazingly economical in the use of gasoline. A demonstration will prove these facts.*

*No wonder the success of this car is mounting at a rate unheard-of in any former year of Velie history.*



Velie Model 58, five-passenger Brougham; a most desirable roomy car; trunk contains two suitcases and hat box; interior equipment includes vanity case, flower vase and smoking set.



Velie Model 58, Touring Sedan; completely equipped; disc wheels, two extra cord tires; two suitcases and hat box; step plates, body rails, luxurious interior features.



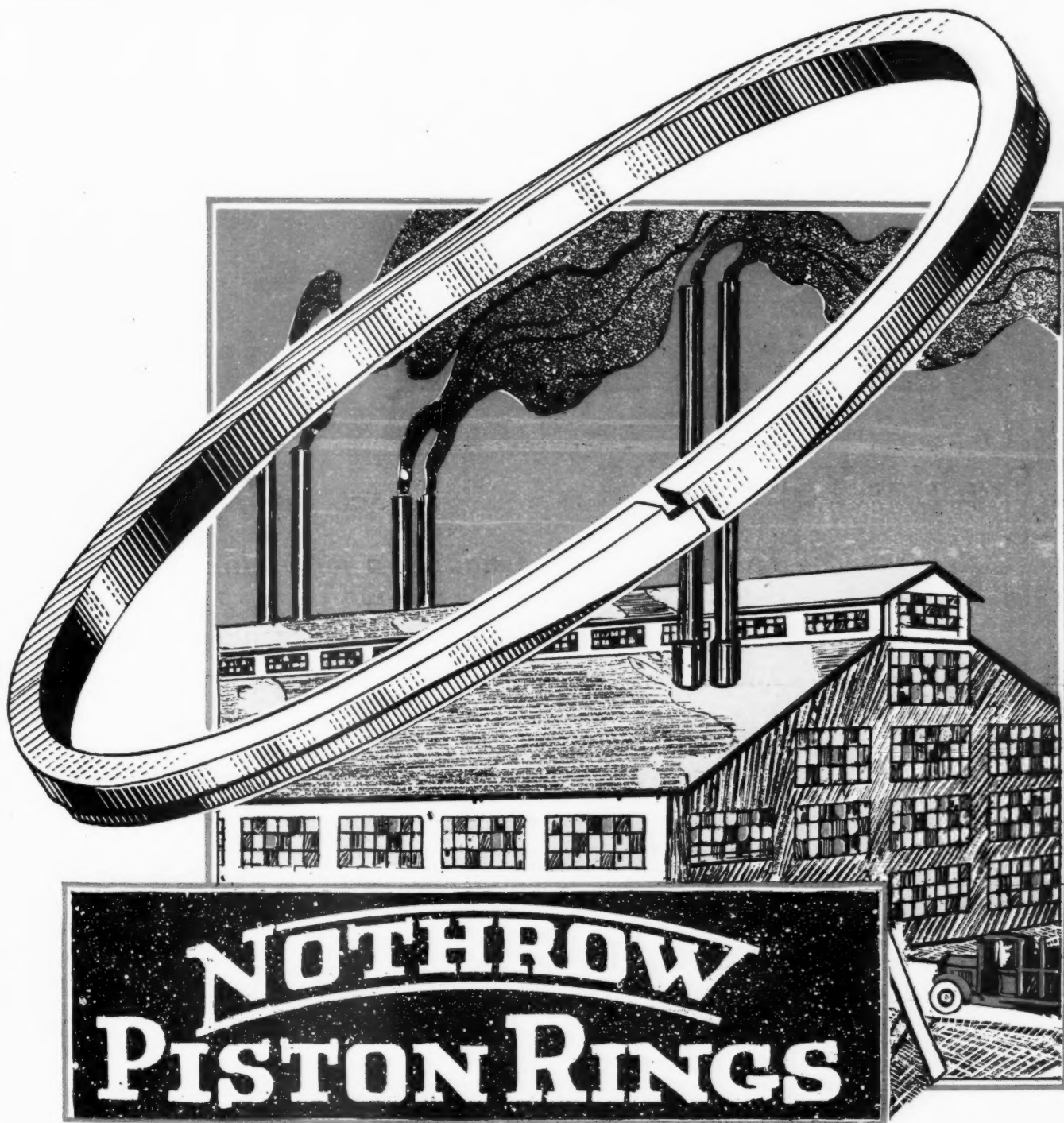
The fact that Velie sales have increased steadily, even through the midsummer season, would mean much to you if you held a Velie contract. Good dealers everywhere are inquiring about the Velie franchise.

We have some choice territory available. Perhaps yours is one of them. There is a proposition here that will interest you no matter what your present affiliations are.

VELIE MOTORS CORPORATION  
MOLINE, ILLINOIS



EVERY TIME  
WE SELL A CAR  
WE MAKE A FRIEND



At Last!

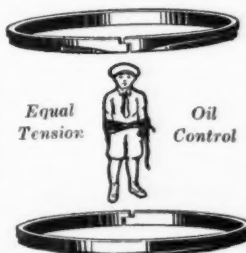
## A Ring that gives Equal Pressure

THE scientific principle employed in the construction of the Nothrow Piston Ring insures the perfect ring groove fit of the concentric ring, as well as the equal radial cylinder wall pressure featured in the eccentric piston ring.

The radial slot in this ring not only creates equal wall pressure at all points but in addition, the shoulder will prevent any excess oil from entering the firing chamber.

In order to convince yourself of

the superior quality of Nothrow Piston Rings, order a set of them for any piston ring replacement job you have regardless of how difficult it may be, and then let their performance tell the story.



This ring is now being used by hundreds of good motor repair shops. **Specialty Jobbers or Parts Distributors** who want a piston ring that will bring repeat business should investigate the unusual proposition made on Nothrow Piston Rings.

**NOTHROW PISTON RING CO.**  
1703 Fairmount Ave., Philadelphia, Pa.



# *The New* **McQUAY-** **MOTOR RE-CONDI** **What it means to Repair Shops**

## **It Enables You:**

- To completely re-condition a motor in one or two days.*
- To quote a flat price to the car owner in advance.*
- To do the whole job at a far lower price than before.*
- To make greater profits than you have ever made before.*
- To re-equip the motor with the finest replacement parts made.*

Here's a chance to come in on a big volume of business that's been going by the door. Ninety per cent of the motors in use today are good for 10,000 to 20,000 more miles if *properly* reconditioned. The business is there, but the average car owner balks at the uncertain and high cost and delay of the old *guesswork* "overhaul" methods.

Operating as a McQuay-Norris Motor Re-conditioning Station, you can build up a type of service car owners have been waiting for and are willing to pay for. This proved plan is solving the car owner's problem and increasing the repairman's volume and profits. Consider this, too. It doesn't require any big investment to operate under this plan. The addition of one or two inexpensive tools to your present equipment enables you to re-condition cylinder walls without removing the block from the frame.

There have been remarkable developments in tools for this work. There are successful tools available, at small cost, for doing this work by any of the methods individual repairmen may prefer. Good tools, made by dependable manufacturers and sold by your own jobber. They produce accurate work.

---

# NORRIS TIONING PLAN

## *Stationing this service*

Whether you specialize on one or two makes of cars or do a general repair business, the McQuay-Norris Motor Re-conditioning Plan offers a real opportunity for greatly increasing your volume of business and returning profits impossible under the old "guesswork" methods.

### **Nationally Advertised to Car Owners**

Repair shops operating as McQuay-Norris Motor Re-conditioning Stations also have the national advertising of McQuay-Norris in the Saturday Evening Post and other publications to help swell their profits. Each shop has an outside sign, showing that this Nationally Advertised Service can be obtained there. This not only brings many jobs into the shop—but gives all customers more confidence in the repairman's ability to serve them quickly and economically.

The repair business is changing—and the repair shops displaying the McQuay-Norris Motor Re-conditioning sign are going to get the business. We want you to know more about it. It's a big story. Ask your jobber's salesman about it, or write us and we will see that you are fully informed of this big new plan.

**MCQUAY-NORRIS MANUFACTURING CO.**  
General Offices, St. Louis, U. S. A.

Factories: St. Louis, Indianapolis, Connersville, Ind., Toronto, Canada

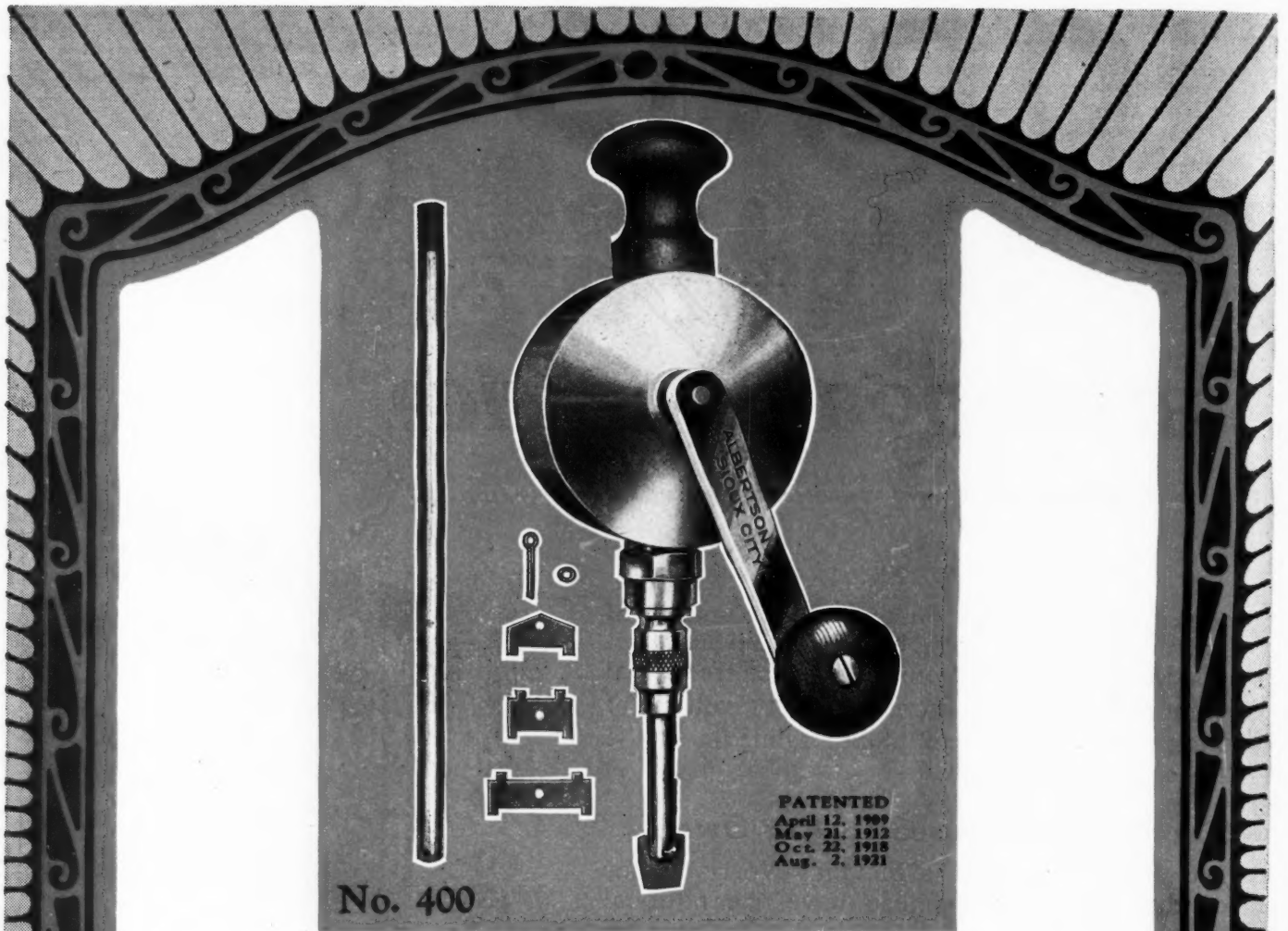
#### BRANCH OFFICES:

New York	Chicago	Philadelphia	Detroit	Dallas
San Francisco	Kansas City	Seattle	Boston	Pittsburgh
Atlanta	Memphis	Omaha	St. Paul	Columbus
		Oklahoma City		



*This outside sign spots your shop as a station for this new service. Car owners will look for it. Ask your jobber's salesman or write McQuay-Norris Manufacturing Co., Dept. M, St. Louis, how to get one.*



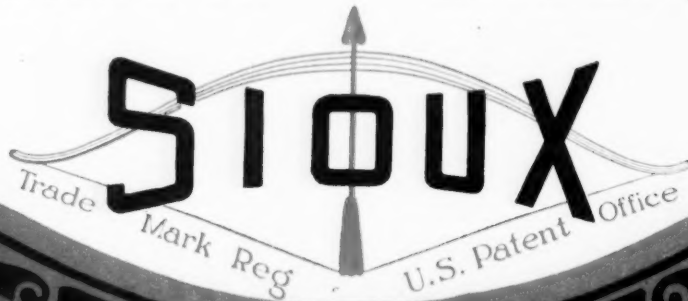


## Sioux Valve Grinder

Time is money and time lost is avoidable waste. You can cut your avoidable waste by the use of this fast and efficient Sioux Valve Grinder. Grinds correctly and quickly. Has that reciprocating, or back and forth motion on the valve, so necessary to perfect valve grinding.

### Jobbers Everywhere Sell Them

Write for Catalogue and Valve Seat Reamer Specifications  
ALBERTSON & CO. SIOUX CITY, IOWA



# 7 out of 10

## Cars that drive to your shop have faulty brakes

*What Do You Intend to  
Do About It?*

**A**RE you going to let this big business slide or will you do as is being done in aggressive service stations and garages all over the country—push brake re-lining?

Re-lining brakes the Eveready way is a quick, simple job and profitable. When a motorist drives up to your shop for repairs or gas, look over his brakes. If they need attention, tell him so. He will heed your advice for the average motorist knows the danger of faulty brakes.

*We want a KELSO MAN  
—a brake lining specialist  
—in every city and town—*

a man whom we will assist with close co-operation in every way—with a brake lining and clutch facing line of unquestioned quality—with sales and service helps such as:—

*High-grade Motor Driven Relining machine  
at small cost  
Cabinets for Display  
Mats for newspaper advertising  
Kelso MAN metal service signs  
Posters for the window, etc.*

Let us tell you about our plans for attracting the cream of the brake lining business to your shop.



**Splendid  
Territory  
Open to  
Aggressive  
Distributors**

**KELSO  
MFG. CO.**  
TRENTON,  
NEW JERSEY

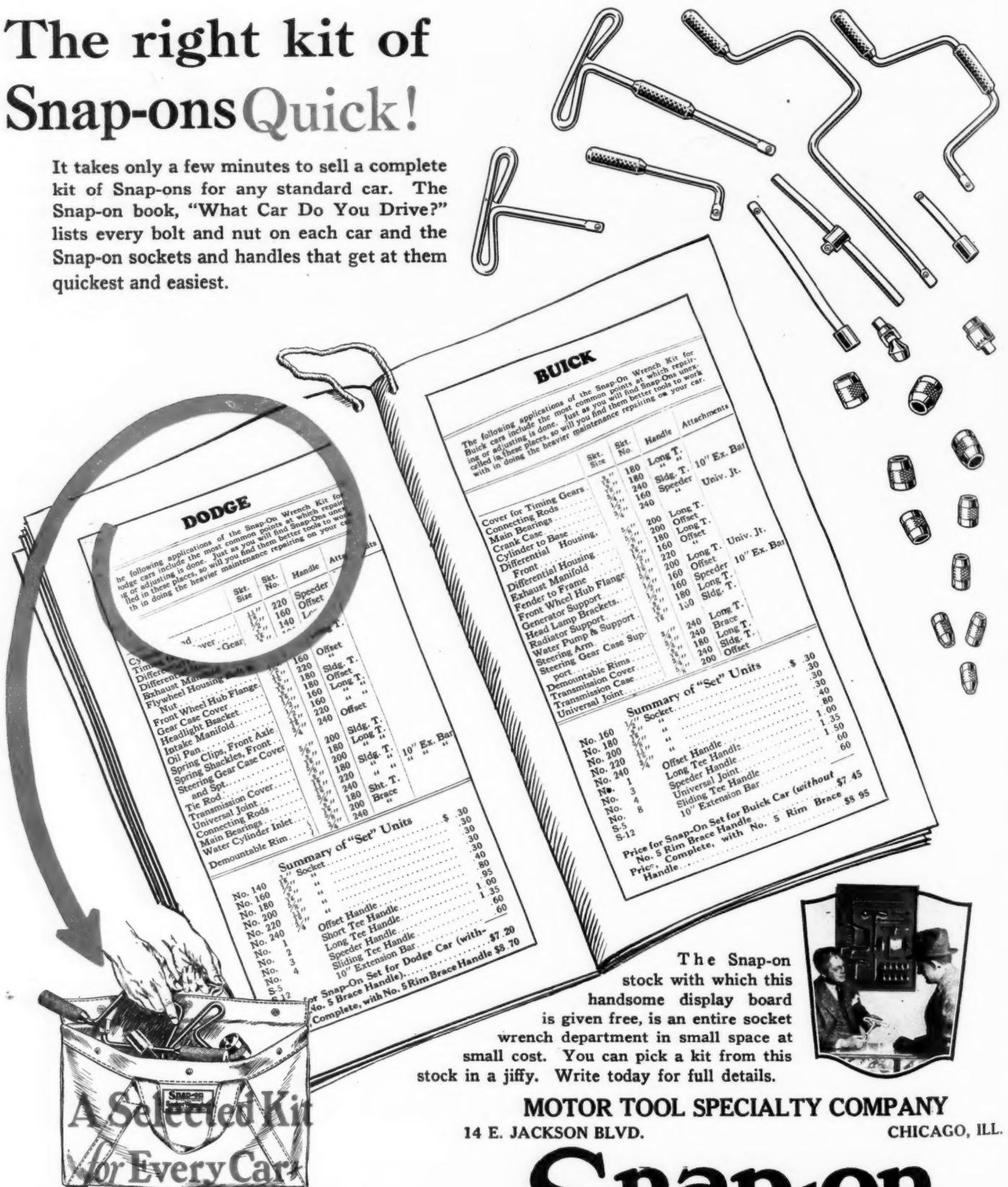
# Ever Ready

## BRAKE LINING & Clutch Facings



# The right kit of Snap-ons Quick!

It takes only a few minutes to sell a complete kit of Snap-ons for any standard car. The Snap-on book, "What Car Do You Drive?" lists every bolt and nut on each car and the Snap-on sockets and handles that get at them quickest and easiest.



**DODGE**

The following applications of the Snap-On Wrench Kit for Dodge cars include the most common points at which repairing or adjusting is done. Just as you will find Snap-On sockets in these places, so will you find them better tools to work with in doing the heavier maintenance repairing on your car.

	Skt. Size	Skt. No.	Handle	Attachments
Cover for Timing Gears	1/2"	180	Long T.	10" Ex. Bar
Connecting Rods	3/4"	180	Slid. T.	Univ. Jt.
Main Bearings	1"	240	Slid. T.	Univ. Jt.
Crank Case	1 1/4"	160	Slid. T.	Univ. Jt.
Cylinder to Base	1 1/2"	240	Slid. T.	Univ. Jt.
Differential Housing	1 3/4"	200	Long T.	Univ. Jt.
Front Differential	2"	200	Offset	Univ. Jt.
Exhaust Manifold	2 1/4"	180	Long T.	Univ. Jt.
Fender to Frame	2 1/2"	160	Slid. T.	Univ. Jt.
Front Wheel Hub Flange	2 3/4"	160	Slid. T.	Univ. Jt.
Generator Support	3"	240	Long T.	Univ. Jt.
Head Lamp Support	3 1/4"	240	Long T.	Univ. Jt.
Radiator Pump & Support	3 1/2"	240	Long T.	Univ. Jt.
Water Pump & Support	3 3/4"	240	Long T.	Univ. Jt.
Steering Arm	4"	240	Long T.	Univ. Jt.
Steering Gear Case Support	4 1/4"	240	Long T.	Univ. Jt.
Demountable Rims	4 1/2"	240	Long T.	Univ. Jt.
Transmission Cover	4 3/4"	240	Long T.	Univ. Jt.
Universal Joint	5"	240	Long T.	Univ. Jt.

**Summary of "Set" Units**

No. 140	Socket	\$ .30
No. 160	"	.30
No. 180	"	.30
No. 200	"	.30
No. 220	"	.30
No. 240	"	.30
No. 1	Offset Handle	.80
No. 2	Short Tee Handle	.95
No. 3	Long Tee Handle	1.00
No. 4	Sliding Tee Handle	1.35
No. 5	10" Extension Bar	1.50
S-5	Complete, with No. 5 Rim Brace	\$7.45
S-12	Complete, with No. 5 Rim Brace	\$8.95

**BUICK**

The following applications of the Snap-On Wrench Kit for Buick cars include the most common points at which repairing or adjusting is done. Just as you will find Snap-On sockets in these places, so will you find them better tools to work with in doing the heavier maintenance repairing on your car.

	Skt. Size	Skt. No.	Handle	Attachments
Cover for Timing Gears	1/2"	180	Long T.	10" Ex. Bar
Connecting Rods	3/4"	180	Slid. T.	Univ. Jt.
Main Bearings	1"	240	Slid. T.	Univ. Jt.
Crank Case	1 1/4"	160	Slid. T.	Univ. Jt.
Cylinder to Base	1 1/2"	240	Slid. T.	Univ. Jt.
Differential Housing	1 3/4"	200	Long T.	Univ. Jt.
Front Differential	2"	200	Offset	Univ. Jt.
Exhaust Manifold	2 1/4"	180	Long T.	Univ. Jt.
Fender to Frame	2 1/2"	160	Slid. T.	Univ. Jt.
Front Wheel Hub Flange	2 3/4"	160	Slid. T.	Univ. Jt.
Generator Support	3"	240	Long T.	Univ. Jt.
Head Lamp Support	3 1/4"	240	Long T.	Univ. Jt.
Radiator Pump & Support	3 1/2"	240	Long T.	Univ. Jt.
Water Pump & Support	3 3/4"	240	Long T.	Univ. Jt.
Steering Arm	4"	240	Long T.	Univ. Jt.
Steering Gear Case Support	4 1/4"	240	Long T.	Univ. Jt.
Demountable Rims	4 1/2"	240	Long T.	Univ. Jt.
Transmission Cover	4 3/4"	240	Long T.	Univ. Jt.
Universal Joint	5"	240	Long T.	Univ. Jt.

**Summary of "Set" Units**

No. 140	Socket	\$ .30
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**A Selected Kit for Every Car**

The tough and handy Snap-on leatherette Kit Bag makes a handy package to sell and an easy one for the motorist to carry. Two or three handles and a half dozen sockets make an average kit.

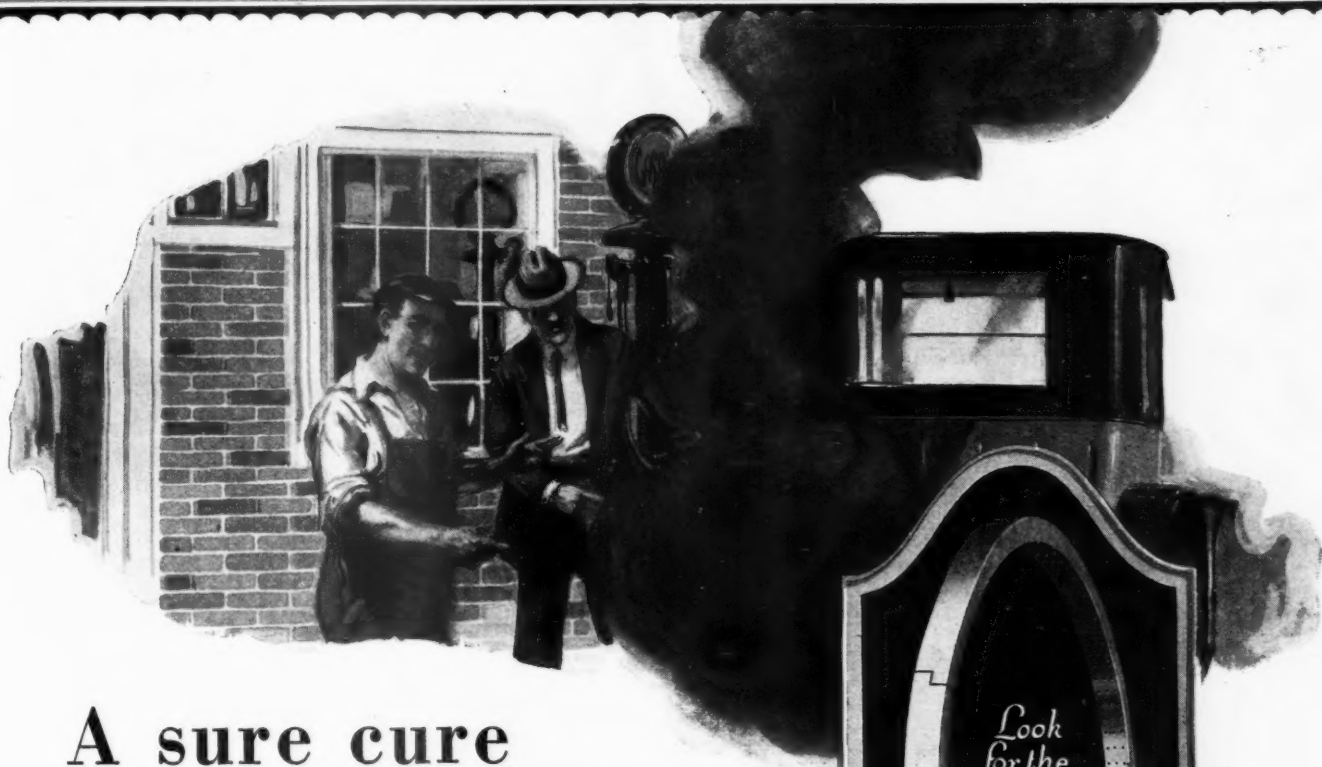
The Snap-on stock with which this handsome display board is given free, is an entire socket wrench department in small space at small cost. You can pick a kit from this stock in a jiffy. Write today for full details.

**MOTOR TOOL SPECIALTY COMPANY**  
14 E. JACKSON BLVD. CHICAGO, ILL.

# Snap-on

INTERCHANGEABLE  
Socket Wrenches

"The Greatest Service With the Fewest Tools"



## A sure cure for "oil-burners"

Eliminate waste—give your customers full mileage from their gasoline and oil by installing correctly designed and accurately machined American Hammered Piston Rings.

American Hammered Piston Rings do the job—the leakless quality is hammered into every ring. They are nationally known, nationally distributed.

Make a profit and build good will with these rings—ask your Jobber.

*Write us for our Service Station proposition.*

Factory List Prices  
Up to 4 $\frac{1}{8}$  inches **60c**  
To Fit Fords . . . **50c**  
To Fit Chevrolets . . . **50c**  
No extra charge for oversizes

# American *Hammered* Piston Rings

AMERICAN HAMMERED PISTON RING COMPANY, Baltimore, Maryland—Export Department, 461 Eighth Avenue, New York, U.S. A.



# The Most in the World *Overland*

Q The only touring car at the price having an all-steel touring body with a real baked enamel finish.

Q The only automobile having Triplex springs (*Patented*) which provide a springbase of 130 inches—and the same road comfort as a large, heavy car.

Q The strongest rear axle, we believe, under any car at or near the price—Mo-lyb-den-um steel axle shafts 1½ inches thick at bearing points—genuine Timken and New Departure bearings at *five* points—an unusually sturdy housing—exceptionally large gears.

Q A powerful engine that turns up 20 miles and more—actually—to the gallon of gasoline and uses surprisingly little oil. A sturdy engine, tried and true, dependable, superior.

Touring \$525, Roadster \$525, Red Bird \$750, Coupe \$795, Sedan \$860; f. o. b. Toledo. We reserve the right to change prices and specifications without notice

*This is the most profitable year*

# Automobile for the Money

\$525  
*f.o.b. Toledo*

Q A single plate, disc type clutch, running in oil and fully enclosed against dirt.

Q A heavy-section, heat-treated front axle, with Timken adjustable taper roller bearings in wheels.

Q A selective sliding-gear type transmission, three speeds forward and reverse, with heat-treated nickel steel gears of stub-tooth type.

Q More braking area than any other light car—one square inch of braking surface to every nineteen pounds of car weight.

Q Higher resale value—look it up yourself.

Q Sound as a dollar from end to end. *Winning, because of its greater value, the greatest sales in Overland history.*

Q If you want to work, and are ambitious to build a permanent business based on solid worth, write today for franchise details.

WILLYS-OVERLAND, INC., TOLEDO, OHIO

*Willys-Overland Ltd., Toronto, Ontario*

WILLYS-OVERLAND *merchants ever knew*





## A REAL INSURANCE AGAINST FAN BELT TROUBLES



**O**UR business is making fan belts better and our latest achievement we have named Super-Service.

Super-Service Fan Belts come wrapped in pairs. Here is an insurance policy for your customers—a policy which is all benefits and no payments.

Super-Service is a real cord belt, tough, pliable and long wearing. It has a metallic finish, which is the result of a special treatment. This finish gives Super-Service a far greater resistance to the destructive effects of heat, oil and water.

Tests have shown that Super-Service Fan Belts wear longer, but the time will come when even the toughest belt will need replacement. And when such a time does come, the car owner who carries a "spare" Super-Service in his tool-box will think kindly of the dealer who sold him the twin package.

If you have not already stocked Gilmer Super-Service Fan Belts, ask your jobber's salesman for complete information, or write to

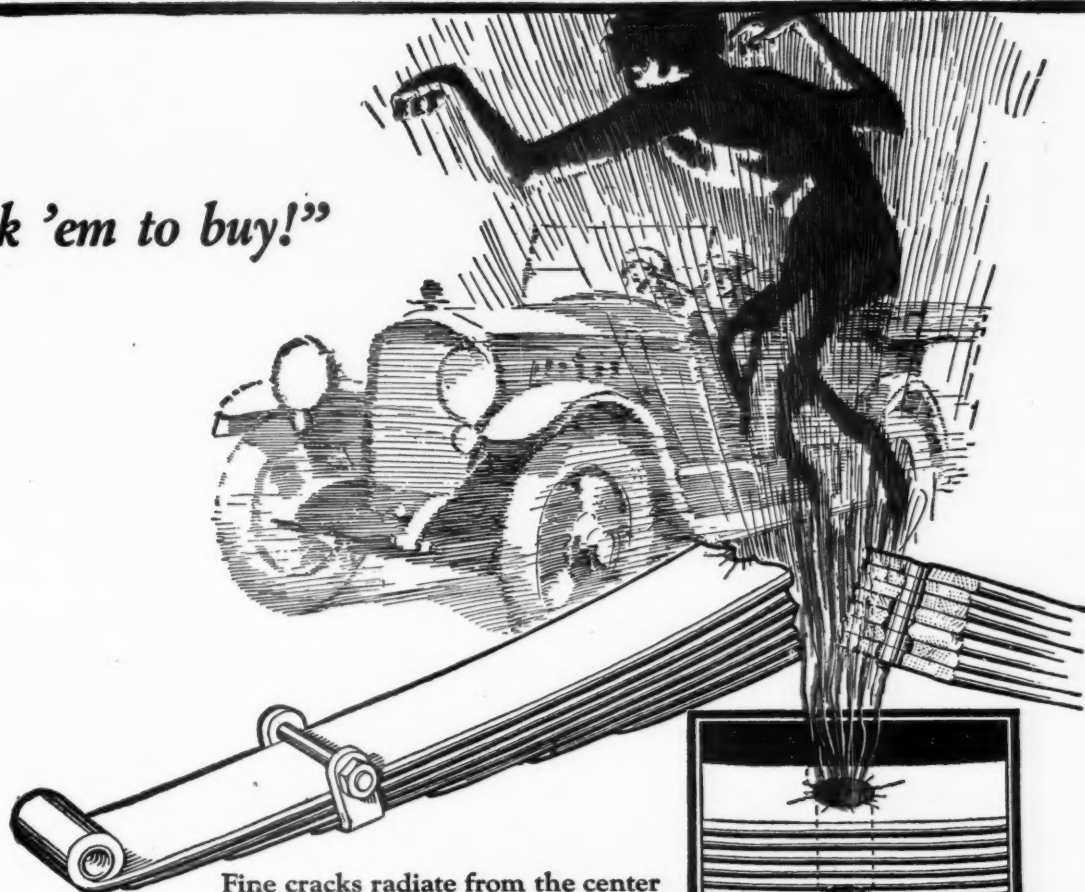
**L. H. GILMER CO., Philadelphia**



*"It's a Gilmer Product—  
you can depend on it."  
—Happy Van, the Gilmer Man.*

# Gilmer

"Ask 'em to buy!"



Fine cracks radiate from the center holes and nibs in all other springs.

## CRACKED METAL— How many jolts will it stand?

*Ask 'em to buy Titanics. Dealers can increase their sales by a simple selling argument*

9 out of 10 springs that you have to replace, have broken at the center. The process of punching out the center bolt hole or nib is so great a strain on the metal that it cracks. Eventually, under constant jolts these cracks grow larger and the weakened metal gives way.

Titanic Unbreakable Hump Center Springs are the only springs made WITHOUT center holes or nibs. At the cen-

ter—the danger point of all other springs—Titanics are strongest. So strong in fact, that they are guaranteed *forever* against center breakage.

This is a simple selling argument but it is effective. It insures a sale. Both you and the buyer profit.

For price list and complete information—write your nearest distributor, listed in Chilton's and Auto Trade Directory.

# TITANIC

Trade Mark Reg.



# SPRINGS

TUTHILL SPRING COMPANY

Established 1880

760 Polk St., Chicago, Ill.



THE successful merchant in all fields concentrates his business on the nationally known, well advertised lines, selecting the leader in each field.

*Quoted from PRINTERS' INK:*

There must be good team-work between advertising and selling.

Advertising leads prospects to the water but it cannot always make them drink—it takes a certain amount of sales effort on the part of the dealer to do that.

The maximum cannot be obtained from advertising except when the retailer follows up the interest that it creates.



**THE AC PLUG KIT**  
*To carry spare plugs*

## Make Four Sales Instead of One

When the motorist asks for a plug place the **AC Plug Kit** before him, containing four plugs. Show him how convenient it is when the motor misses or performs poorly to take the **AC Plug Kit** and change the plugs. Then at his convenience he can clean and test the removed plugs and put them back into the **AC Plug Kit** for future use. You can offer them these **AC Plug Kits** free, with a set of AC's—the kits cost you nothing; ask your Jobber's salesman.

*The opposite page proves why AC's are the leader in the spark plug field.*

# S e l l   A C   S p a r k

The Standard Spark Plug of the World



## THE LEADER

**Just Consider How Many AC-Equipped Cars There Are in Your Locality**

*Think of all the CHEVROLETS—they have always been AC-equipped.*

*—all the BUICKS—AC-equipped for fourteen years.*

*—all the DODGE BROTHERS—have never used anything but AC.*

*—all the NASH cars—always AC-equipped.*

*—OAKLANDS—for the past fourteen years AC-equipped.*

*—all the OVERLANDS—AC-equipped for years.*

*—DURANTS and STARS—always AC-equipped.*

—and all the other cars: Apperson, Cadillac, Case, Chalmers, Chandler, Cole, Dort, Essex, Haynes, Hudson, Hupmobile, Jewett, Jordan, LaFayette, Marmon, Maxwell, Oldsmobile, Paige, R & V Knight, Willys-Knight, and more than two hundred others—all AC-equipped and already in use in your locality.

This tremendous ready-made market for AC's is right at your door and will always be there in ever-increasing size.

<i>CHEVROLET is making about 2,000 cars a day . . . . .</i>	} <b>All AC-Equipped</b>
<i>BUICK is turning out over 800 a day . . . . .</i>	
<i>DODGE BROTHERS are making over 700 cars a day . . . . .</i>	
<i>DURANT and STAR about 1,000 cars a day . . . . .</i>	
<i>OVERLAND and WILLYS-KNIGHT close to 1,000 a day . . . . .</i>	

Then add all the others and just visualize the enormous production, every day, of cars factory-equipped with AC plugs. Each day the demand for AC's grows bigger.

Read on the following page about AC 1075 Special for Fords, which gives

you an opportunity to take first place in the enormous Ford plug replacement business.

There's an AC plug for every motor—you need not tie up money in other brands but concentrate on AC's, the easiest selling, most profitable and best known quality plug.

**AC Spark Plug Company, FLINT, Michigan**

*Makers of AC Spark Plugs—AC Speedometers*

U. S. Pat. No. 1,135,727, April 13, 1915, U. S. Pat. No. 1,216,139, Feb. 13, 1917. Other Patents Pending

# Plugs by the Kit





## “No wonder I’m selling more Hanes Cords!”

“That advertising,” said a Hanes distributor to one of our representatives, “put me and Hanes Cords right on the map in this section. People came in and inquired about Hanes Cords—said the advertising interested them. After that, it was easy to talk Hanes. My sales took a real jump. Why, do you know, I even repeated some of these ads on my own hook! I found your advertising was bringing me real business. I was making more money and could afford to do some extra

advertising myself. No wonder I’m selling more Hanes Cords!”

\* \* \* \*

We need more such distributors—in fact, we will go out of our way to get and keep them. Very briefly, here is our offer: An exclusive territory contract, one that considers your welfare and profit; a product that measures up to the highest standards; a helpful, liberal policy that is distinctive—it’s human. Just ask us to send a representative to talk things over with you.

Winston-Salem,

HANES RUBBER COMPANY,

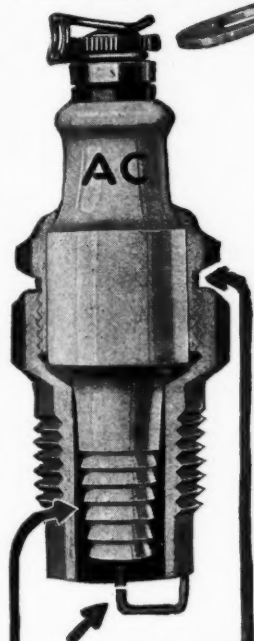
North Carolina

# HANES

## CORD TIRES

*The High Water Mark in Tire-making Skill*

Spring terminal clip permits wire to be instantly detached and reconnected while motor is running. Facilitates testing spark plug and coil. No nut to be unscrewed or lost



New electrode design forms a natural drain so that no oil can lodge in spark gap

Unscrew this bushing and plug comes apart. Notice compact porcelain to withstand hard service

Patented CARBON PROOF porcelain with its high temperature fins attains sufficient heat to burn oil deposits, thus offering effective resistance to carbon

## The Market for AC 1075 is the Largest in Your Community

The market for AC 1075's is the largest in your community because of the large number of Fords in operation and the chance it gives you to sell complete sets of AC 1075's to replace worn-out and incorrectly designed plugs.

No Ford owner is interested in changing brands unless he gets better plugs.

When the Ford driver asks for a plug place the *AC Plug Kit* before him, containing four AC 1075's. Show him how convenient it is when the motor misses or performs poorly to take the *AC Plug Kit* and change the plugs, instead of losing time to locate the missing cylinder—then at his convenience he can clean and test the removed plugs and put them back into the *AC Plug Kit* for future use.

This *AC Plug Kit* is something every Ford owner has always wanted. You can offer them these free with a set of AC 1075's—the kits cost you nothing—ask your jobber's salesman.

This will enable you to sell in sets of not less than four and greatly increase your spark plug sales.

Thousands of dealers are fast building a big, profitable spark plug business on AC 1075's. Our advertising is constantly placing it before the Ford owner who is already impressed with AC quality.

### AC 1075

Special  
for  
Fords

AC Spark Plug Company, FLINT, Michigan

Makers of AC Spark Plugs—AC Speedometers

U. S. Pat. No. 1,135,727, April 13, 1915, U. S. Pat. No. 1,216,139, Feb. 13, 1917. Other Patents Pending



The AC Plug Kit  
—to carry spare plugs

The Standard Spark Plug of the World





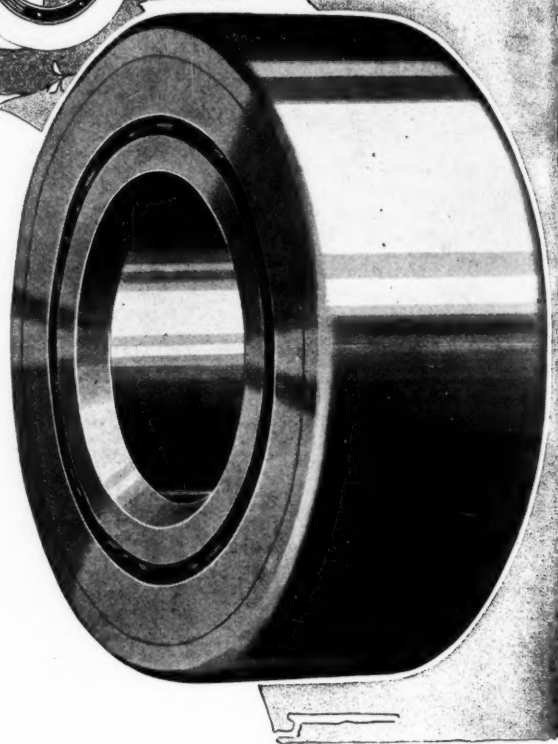
# New Departure Ball Bearings



Perfection of design, construction and performance is expected in a ball bearing more than in any other product of the mechanic arts. The very purpose of the use of New Departures—to practically eliminate friction—compels their makers to undertake, as a matter of course, the most extreme precautions in securing the best materials obtainable, as well as in their subsequent working, treatment and machining and, withal, in the utmost precision in grinding and gauging the finished product.

These methods are traditional in the New Departure plants, which inherit unspoiled the age-old New England passion for fine workmanship, combined with a western spirit of progressiveness in the development of special processes and devices.

Persistence in the pursuit of quality has resulted in a product of superior excellence and precision.

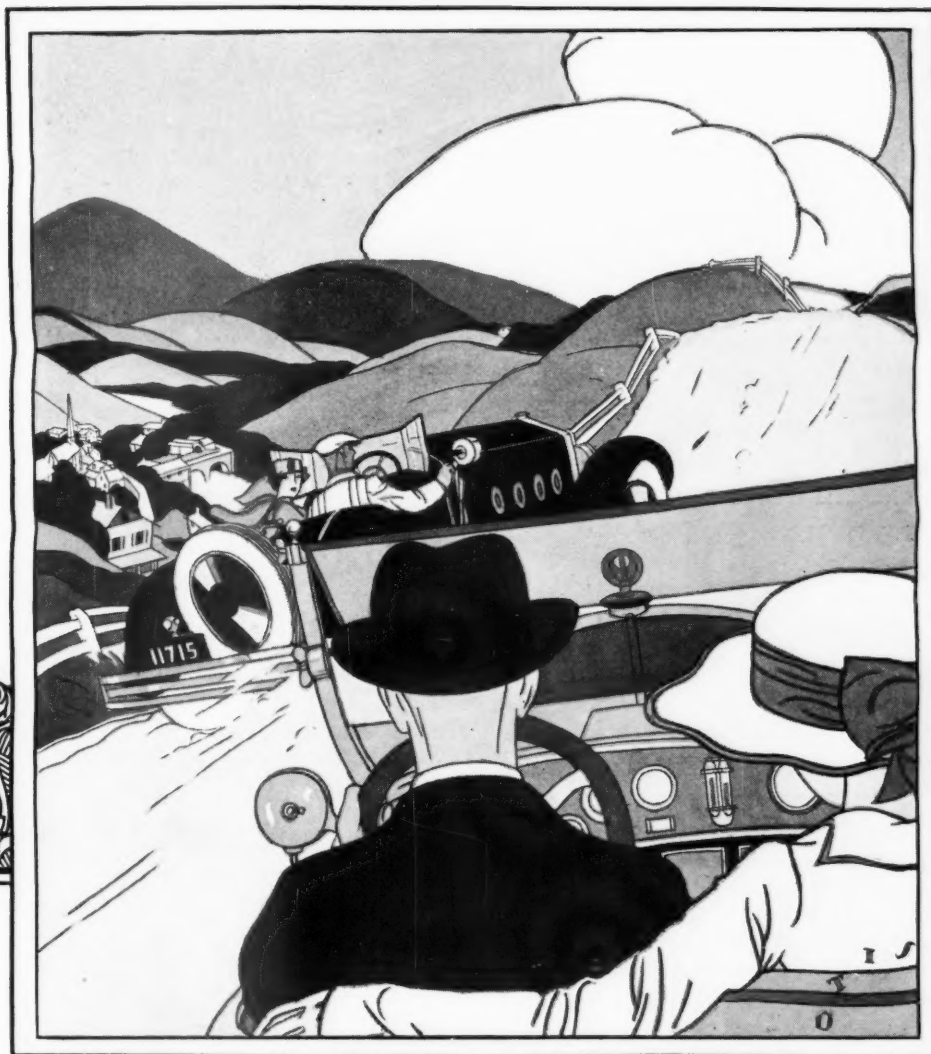


THE NEW DEPARTURE MANUFACTURING COMPANY

BRISTOL, CONN.

Detroit

Chicago



## "Look at John hitting these rough roads now his car is STABILATED

"He tells me he cuts ten minutes off his run to the club.

"Notice the way he eases over those ruts. Going forty, at least.

"I kidded them about passing us so often up here.

"Sympathized with Grace for marrying a speed demon.

"She says it's *you* and *I* who deserve the sympathy.

"George! When I see them so safely navigate roads like this I can't help but believe she is right—particularly so when almost everybody else seems to have STABILATED."

The value of an automobile, its comfort and safety, is measurable by its roadability.

A car is essentially a thing to take you to places in greater comfort, less time and more safely than any other form of conveyance.

STABILATION has given to the automobile the ability to travel over all kinds of road surfaces with an entirely new and remarkable luxury of motion.

STABILATORS are entirely new in principle and in results.



# WATSON STABILATORS

JOHN WARREN WATSON COMPANY, PHILADELPHIA  
CHANGE THE WHOLE NATURE OF YOUR CAR



## On the DUESENBERG "STRAIGHT 8"

Duesenberg engineering speaks for itself—it has spoken nationally and internationally for many years. Naturally, all Duesenberg "Straight Eights" are STABILATED at the factory.



  
**WATSON**  
**STABILATORS**

JOHN WARREN WATSON COMPANY, PHILADELPHIA

CHANGE THE WHOLE NATURE OF YOUR CAR



## A STARRETT CYLINDER GAGE

with all the Starrett reputation behind it and all the Starrett skill and experience built into it. You know what that means in the way of absolute accuracy and fine workmanship.

Several patented features on this improved cylinder gage make it an instrument that should be in every Service shop, Re-bore and Re-grind shop. *It will help you sell more service.*

**THE L. S. STARRETT CO.**

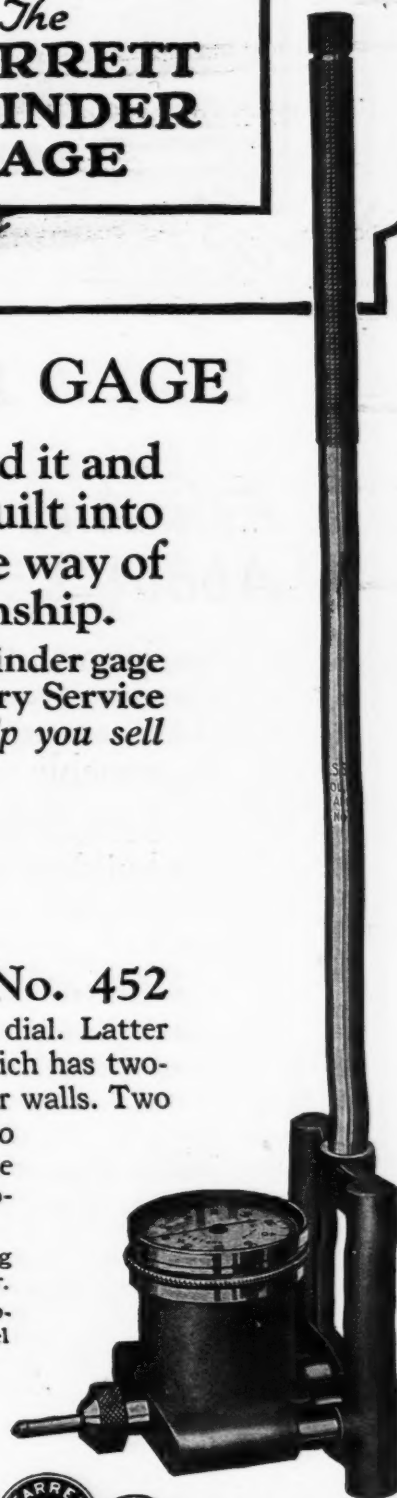
*The World's Greatest Toolmakers  
Manufacturers of Hacksaws Unexcelled  
ATHOL, MASS.*

### STARRETT CYLINDER GAGE No. 452

Of rugged construction—has non-breakable crystal over dial. Latter is mounted on block moving at right angles to sled which has two-line contact points always in alignment with the cylinder walls. Two hardened contact points *independently* cause the hand to travel over the dial (reading in .001") and with a unique double spring action make the gage self-centering and absolutely non-collapsible.

After the variation of the bore has been determined, note the reading on the dial and transfer to an outside micrometer to find the diameter. Two adjustable rods, which can be carried in the hollow handle, provide for diameters ranging from 2½ to 6 inches. Gage is nickel plated. Weight, 12 ounces.

*Write for Catalog No. 22 "RB" and the Supplement  
describing the new Starrett Tools*



5481

# Use Starrett Tools







## Ask Any Old Time Repairman About Packard Cable

He will tell you that years ago, when the horseless carriage was first accepted as a practical possibility—then, as now, Packard Cable was recognized as a dependable unit.

He will tell you that, one after another, the foremost car builders adopted Packard Cable as a standard part of the car.

He will tell you that year after year he has been recommending new Packard Cable for starting, lighting and ignition, rather than attempt repair on an old cable that is badly worn.

He will tell you that more than 300 of the leading jobbers handle Packard Cable exclusively and that any jobber's salesman will take your order to **ship from stock**.

Ask the old time repairman. He knows.

*The Packard Electric Company*

Warren, Ohio



## Do You Pick Winners? Here's One

WHEN you stock your shelves you pick the products that your customers like and will ask for—the rapid-turnover merchandise that you can depend on for constant income. Here is just such a Winner!

# Stafford's RENOL

"The Creamy Polish"



### Stafford's CARBON REMOVER

is a superior preparation for the removal of carbon deposits from cylinders, pistons and valves. It can be relied upon to eliminate all carbon troubles such as knocking, pre-ignition, loss of compression and power, etc.

### CLEANING FLUID

restores the freshness of cloth upholstery, removing spots and stains and bringing back the original colors. It will not burn or explode. Equally good for many household cleaning purposes.

Stafford's Auto-Products also include:

Penetrating Graphite Oil, Radiator Stop Leak, Gasket Cement, Gasket Shellac, Metal Polish, Neatsfoot Oil, Rapid Tar Remover, Black Liquid Tire Cover, Auto Cushion and Top Dressing, Generator and Magneto Oil and Rapid Repair and Engine Enamel.

is the best liked because it is the Best Automobile Polish on the market.

**IT'S QUICKER**—takes only 15 or 20 minutes to go over entire car.

**IT'S EASIER**—no hard back-breaking rubbing; Apply and wipe off.

**IT'S BETTER**—Renol is more than a polish; it cleans and renews as well. Renol gives a high glossy polish that **LASTS** because it won't gather dust.

**AND IT COSTS NO MORE**—RENOL is only one of a fine line of automobile specialties, made by a manufacturer whose reputation has more than half a century behind it. It is an all-round line, convenient and economical to carry, attractively packaged, and every product is so good that it helps the sales of all the others.

### We have Two Remarkable Propositions One for Jobbers, One for Dealers

Renol and its companion specialties are being sold by a novel method which is bound to interest you. It has many distinctive features, but the best of them is that **IT WORKS**—not sometimes but every time. Write for particulars.

S. S. STAFFORD, Inc., 607 Washington Street, New York City  
Manufacturers of Stafford's Inks, Adhesives, etc.



## Performance Is Selling Kissels

Officially sealed in high gear, a standard Kissel Phaeton, powered with a stock "Fifty-five" motor, recently made the famous Yosemite Valley Run—first and only car ever to accomplish this most difficult of California's motoring feats.

This is one of many gruelling tests made with stock Kissels in all parts of the country, under the most severe driving conditions. We cite it not as a "stunt" performance, but only because it is typical of what every Kissel owner may expect of his car, and of what every Kissel dealer has to sell.

The Model "Fifty-five" has proved — even more convincingly than its predecessors—that a beautiful car can be extremely powerful; that high speed can be built beneath a graceful hood; that strength and sturdiness are not a bar to flexibility.

Performance is the deciding factor in automobile sales today. The modern buyer, though impressed by beauty, and appreciating provisions for comfort and convenience, demands **proof** of superiority on the road.

Distributors and dealers find that the Kissel combination of style leadership, custom workmanship and outstanding performance, has made the Kissel an easy and profitable car to sell. This is reflected in the fact that production for the second quarter of 1923 was more than double that of the first quarter—and is likewise reflected in the growth of the Kissel distributing organization.

If you are a progressive distributor or dealer in a territory in which Kissel is not now represented, this franchise should attract you.

Write or wire for details

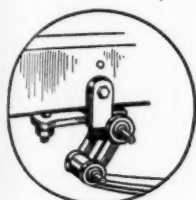
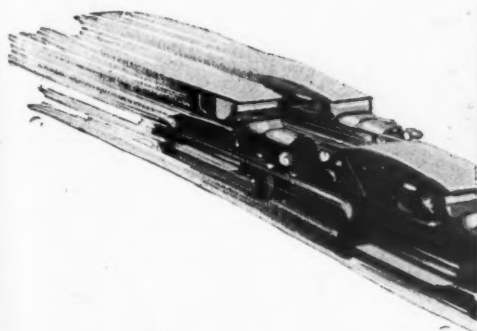
**KISSEL MOTOR CAR CO.**  
Hartford, Wisconsin

# KISSEL

The Custom

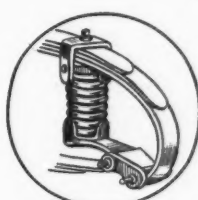


Built Car



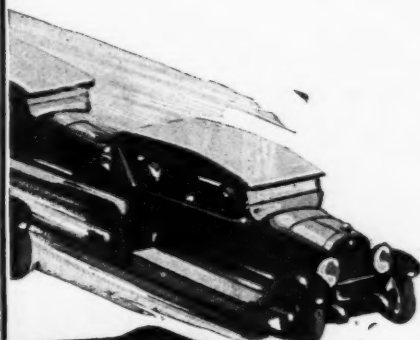
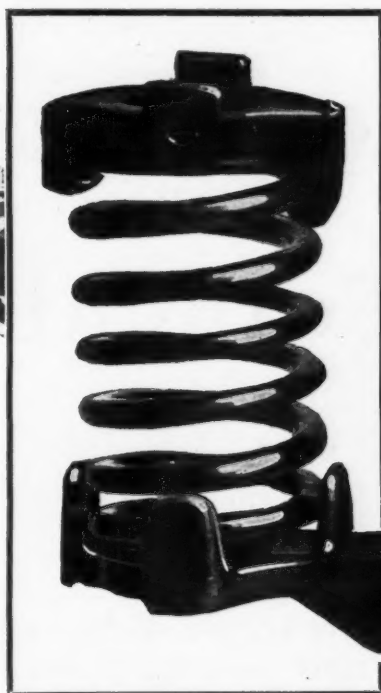
The Front Spring

Action is absorbed through the Shackle Spring Construction of the Giant — all stress and strain being eliminated.



The Rear Spring

When the rebound occurs—the severity of the strain is centered in the spring ends. The Giant coil spring—fitted between springs—“takes up” the rebound and prevents breakage.



## What The Dodge Brothers Cars In Your Locality Mean To You—

Every owner of a Dodge Brothers car in your territory will thank you for showing him the Giant Shock Absorber, for it can give added pleasure and comfort to his driving by soaking up the shocks of the road.

This device eliminates the damage that comes from the terrific rebound caused from plunging in an unseen hole.

The unusually low price of \$22.50 for the complete set is another big selling point that attracts buyers. This

is the lowest priced high grade absorber on the market.

### Simple to Install

The Giant Shock Absorber can be attached to the car in a short time; and all fittings are in harmony with the fittings of the car. Nothing to rattle or jar loose.

We are now allotting territory to live distributors in different districts. Write for the unusual proposition made to distributors on the Giant Shock Absorber.

RED GIANT TOOL CORPORATION

Lynchburg,

Virginia



# Giant

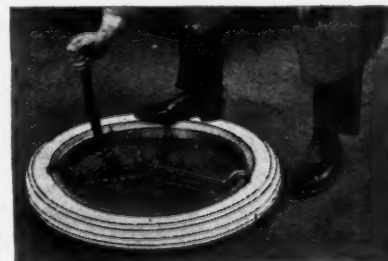
## Shock Absorbers

Built Especially for DODGE BROTHERS CARS

### Red Giant Rim Tool

You can show car owners how this tool pays for itself in time and labor saved, and in protecting the tire from bruises and cuts when tires are removed from rim. Retails for \$5.00—West of Rockies, \$6.00.

Can be folded up and carried in tool box. Spreads or contracts rim. Three points suspension, cannot pull rim out of shape. If jobber can't supply, write direct to Red Giant Tool Corp., Lynchburg, Va.





*for Economical Transportation*



## Which Franchise Pays?

Suppose you set down on paper which automobile franchises are sure money-makers for live dealers.

The list will not be long and Chevrolet should stand at the top.

We are doing more than supplying live merchandisers with the best paying franchise in the market—we are teaching them a new and better way to merchandise economical transportation.

The whole public is getting to realize that the value of an automobile can be measured chiefly by the economy and satisfactory quality of the transportation it delivers.

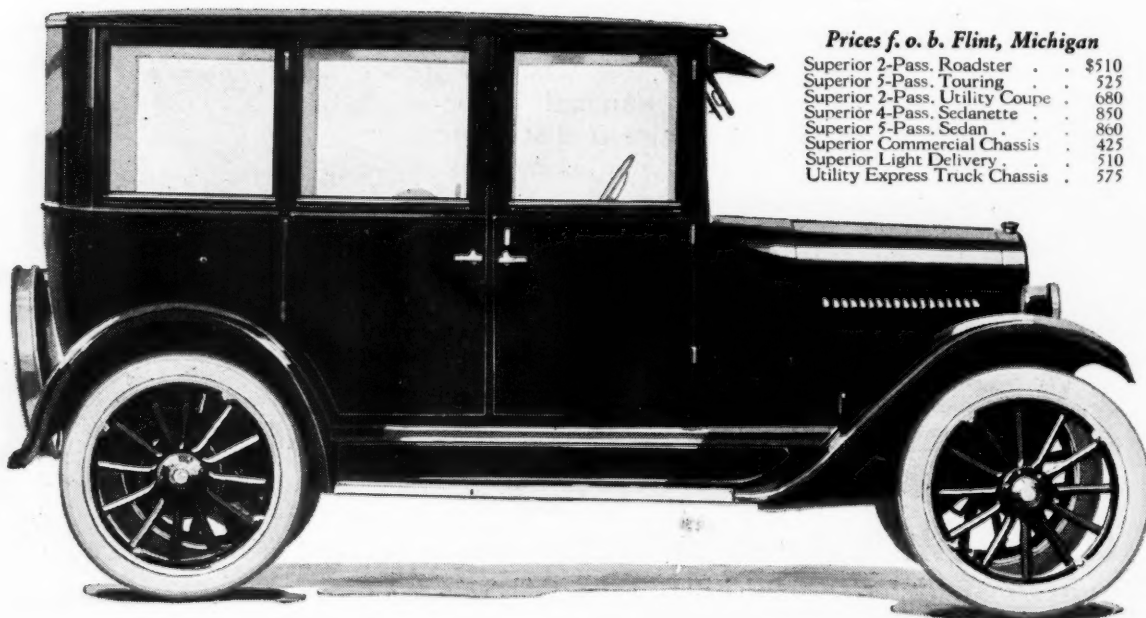
Dealers who are in the automobile business to stay and to make continuous and increasing profits are turning everywhere to Chevrolet, the leading exponent of modern, economical transportation, and therefore, the surest and largest money-maker for them.

Your investigation of the facts may surprise you.

## Chevrolet Motor Company

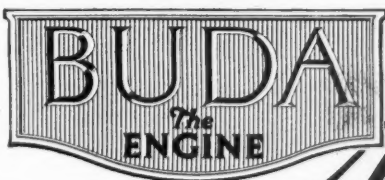
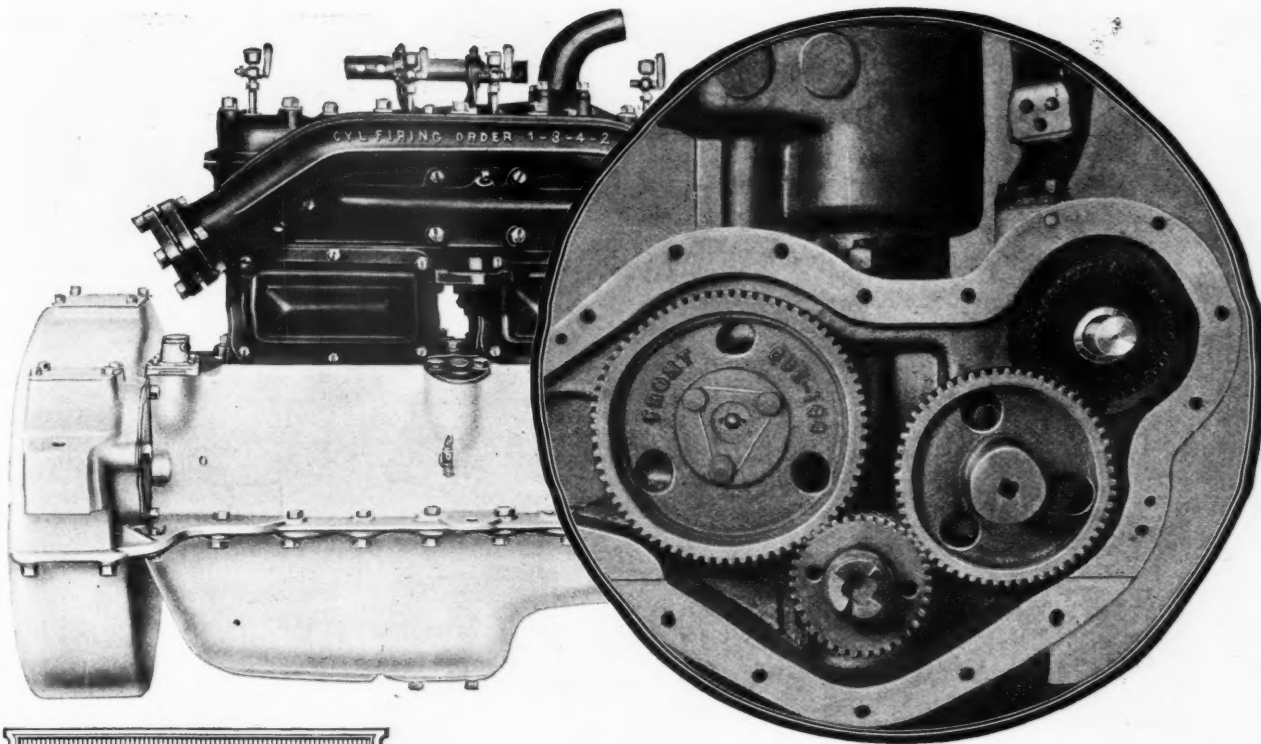
*Division of General Motors Corporation*

Detroit, Michigan



### *Prices f. o. b. Flint, Michigan*

Superior 2-Pass. Roadster	\$510
Superior 5-Pass. Touring	525
Superior 2-Pass. Utility Coupe	680
Superior 4-Pass. Sedanette	850
Superior 5-Pass. Sedan	860
Superior Commercial Chassis	425
Superior Light Delivery	510
Utility Express Truck Chassis	575



*Avoids Noise with*



**F**OR its generator drive gear in Buda truck motors, the Buda Motor Company has selected and is using Formica.

After running in each Buda motor for eight hours the Buda Company tears it down and after a careful examination, reassembles it. Great attention is given the gear fit.

But the generator drive gear is fitted to the generator outside of the Buda plant where Buda control is not effective. By using a Formica gear at that point Buda engineers get quietness. The reason is that Formica allows greater variation of fit without becoming noisy.

In many plants Formica gears are used without selection, and with a tear down of only a fraction of one per cent. Formerly, with metal, tear down sometimes reached thirty per cent. Formica is more durable, more satisfactory, and a far better manufacturing proposition. It gives quietness that cannot be exceeded by any other form of drive. Write for the facts.

**THE FORMICA INSULATION COMPANY**

4642 Spring Grove Avenue, Cincinnati, Ohio

**FORMICA**  
Made from Anhydrous Redmanol Resins  
**SHEETS TUBES RODS**



# LINCOLN



## Standard Equipment

*On Four Wheel Brake*  
**RICKENBACKER**  
*And On*  
**APPERSON SIX**



The strength and simplicity of Lincoln construction makes these fast-working shock absorbers far more satisfactory, from the car manufacturer's, the dealer's and the owner's point of view.



Lincolns are continuously advertising in the Saturday Evening Post and nationally distributed by over one hundred leading Automotive Accessory Jobbers.

DEALERS—Write for the facts.

**LINCOLN PRODUCTS COMPANY**  
 1253 So. Michigan Ave. Chicago, Ill.

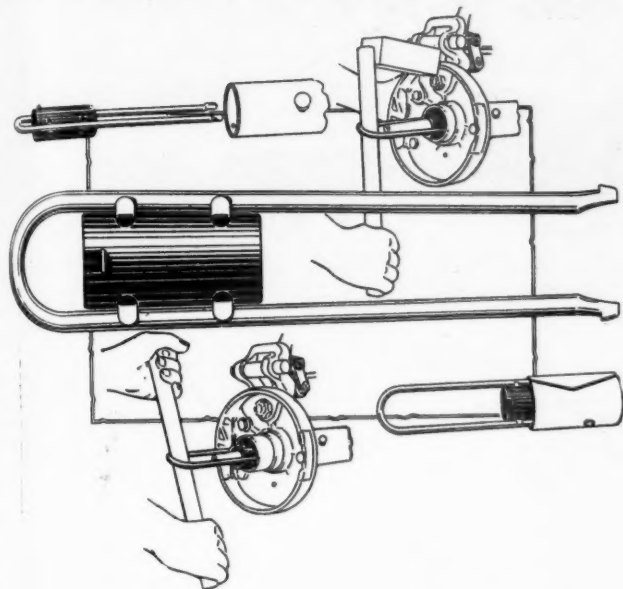
# SHOCK ABSORBERS

# Every Shop Needs These Tools

Also Fleet Owners And Ford Owners Who Work On Their Own Cars

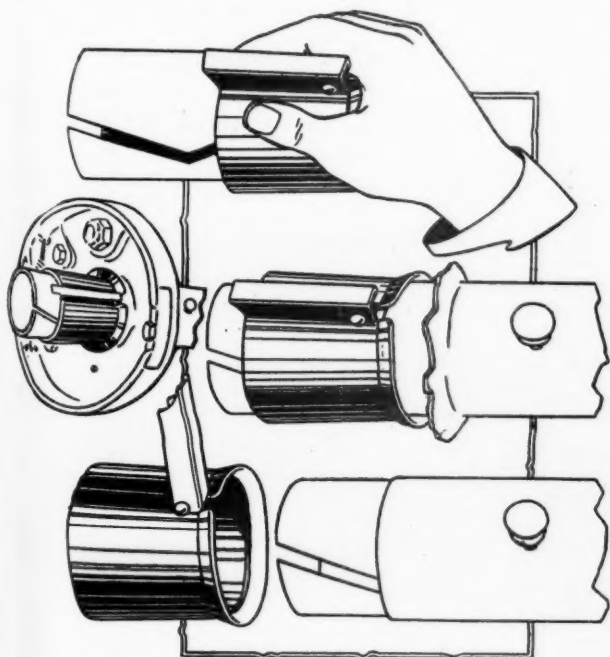
## RAFFAY

**Sleeve Puller And Contractor**  
For Pulling and Contracting Hyatt Bearing Sleeves  
IN FORD REAR AXLES



**These Two Tools  
Are Sold In a Unit**

**Price \$1.75**



Patented July 10, 1923

These are two of the handiest tools ever designed for the mechanic who works on Ford cars. The illustrations at the left show what a simple job it is to contract and pull the sleeve in a Ford rear axle. Compare this with the old methods and you can see why the job can be done in a fraction of the time. The price is so low that every mechanic in the shop should have these tools in his kit.

Sleeves can be removed with or without axle shafts in place. Simplicity of operation combined with heat treated special alloy steel makes these tools everlasting. They save hours of time for the busy mechanic or Ford owner and the first time they are used they pay for themselves.

Your jobber will supply you or write us direct.

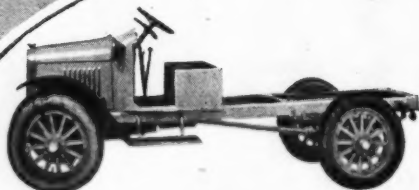
Manufactured and Distributed by



**JOHN C. HOOF & CO.**  
137 W. Illinois St. Chicago



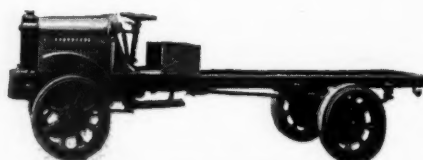
# *The New* **BETHLEHEM**



KN "AIRLINE"  
\$1385



GN "FAST FREIGHT"  
\$2185



HN "HEAVY DUTY"  
\$2985

A fine, strong, smooth running motor truck with dominating sales features and a perpetual contract that protects Bethlehem dealers year after year. The New Bethlehem is new in every respect—management, personnel, design and sales policy. The sales features on the New Bethlehem are compelling—straight line drive shafts, double reduction axles running in oil, oil magazine chassis lubrication, heavy chrome vanadium steel springs. Enquire now if the Bethlehem franchise is open in your territory. Get all the facts and at least you'll learn something new in Motor Truck merchandising.

**THE NEW**  
**BETHLEHEM MOTORS CORPORATION**  
**OF NEW YORK**

**ALLENTOWN**

**PENNSYLVANIA**

# How This Company's Stability Protects You



**THE  
DISPLAY  
THAT SELLS  
JACKS**

## FREE to Dealers

This display stand has proven its value, as shown by the reports of 6,000 dealers who have used them. Now on file at our office. It is selling jacks for these 6,000 dealers. It will sell them for you. Send for our plan. The stand is free with small assortment of jacks.

Every business man wants to know something about the concerns from which he buys. For just as the motorist depends on his jack in road emergencies, so the accessory dealer often depends upon the concerns from which he buys in business emergencies.

The Walker Manufacturing Company has been making dependable jacks for 14 years. It has constantly aimed to make stronger, safer and better jacks.

Over five thousand Walker Jacks leave the plant daily. There is a Walker Jack for every car, for every purpose. Each one is scientifically made and carefully tested. For failure in a jack reflects upon its maker, as well as upon the dealer who sells it. Although the dealer who sells a faulty jack has the most to lose, for it usually costs him other business.

More Walker Jacks are in use than those of any other make. The Walker plant is the biggest and most completely equipped of its kind in the world.

The magnitude of Walker business, the number of Walker accessory dealers and jobbers, the number of Walker Jack users, the financial standing and trade prestige of the Walker Manufacturing Company, ought to convince any sound business man that the Walker Proposition must be 100 per cent right, sound, and permanent.

Then too, there is the Walker Jack national advertising in The Saturday Evening Post, where the millions are told about Walker Jacks every month.

Walker Jack dealers find an unusual amount of sales support coming their way.

Enlarged (Jumbo) proofs of Walker advertisements in The Saturday Evening Post are furnished free to dealers, as are store cards and signs, supplies of a motorist's booklet "Emergencies," and other sales helps.

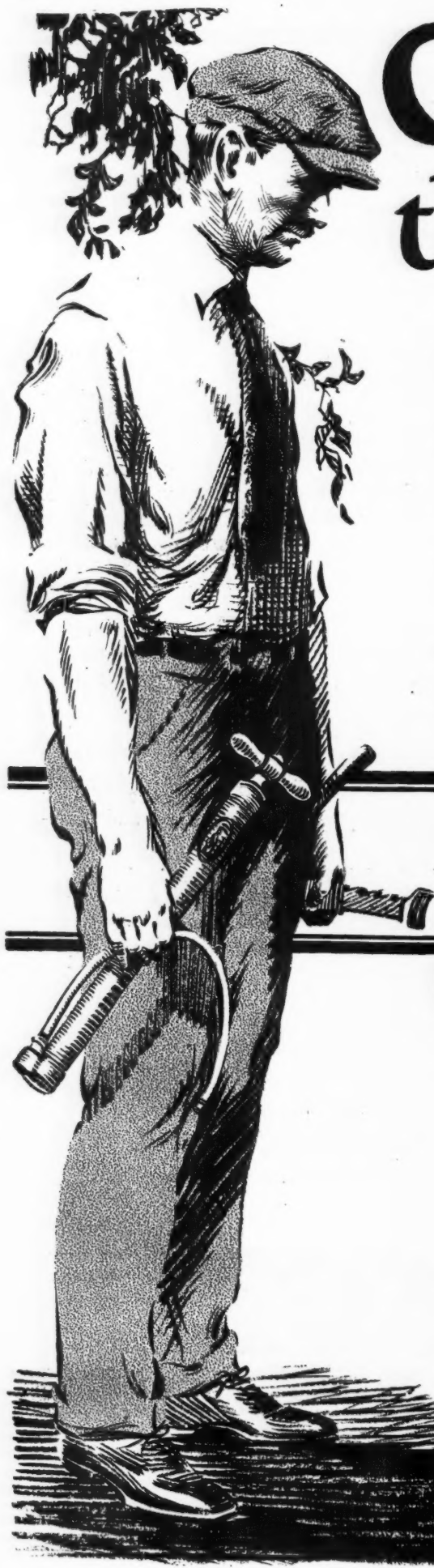
*Ask your jobber's salesman, or write direct to*

**WALKER MANUFACTURING CO.**  
Racine, Wis.

# Walker JACKS

*"Dependable in Emergencies"*





# Our Friend the Customer

He is human. He hates to pump tires, just as you and I hate it. He carries a spare to save himself this job as much as he can.

But times come when he DOES have to use his pump. Then your reputation with him is put to the test.

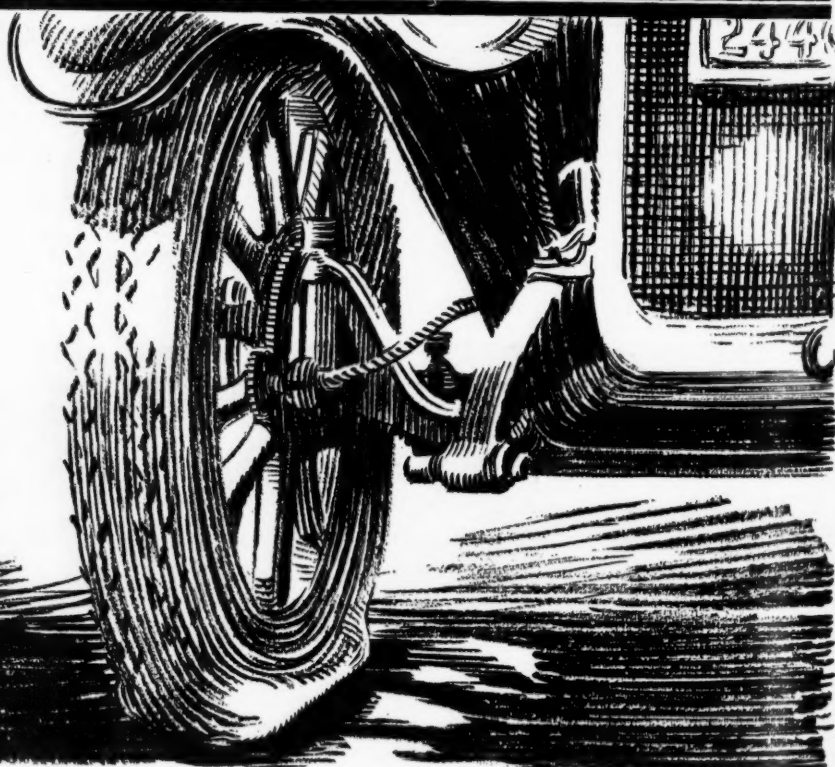
If you have sold him a Rose, all will be well. Even the largest tires are easy to pump with a Rose.

But if you have sold him a cheap, shoddy pump—beware, you have made an enemy who will be reluctant to renew his friendship for you.

More Rose Tire Pumps are sold each year than all other makes combined. That is eloquent proof of the fact that you should make the Rose the back-bone of your tire pump sales.

FRANK ROSE MFG. CO., HASTINGS, NEBR.

## ROSE TIRE PUMP



# FEDERAL

## Automotive Rubber Accessories

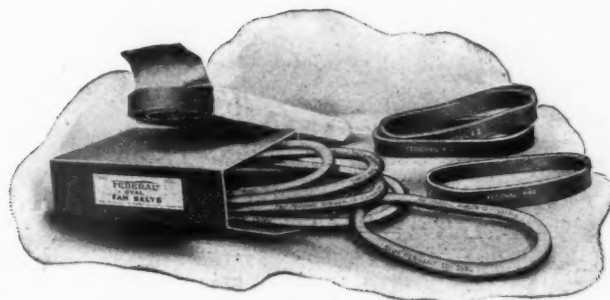
Radiator Hose

Fan Belts

Floor Board Mats

Repair Kits

Inside Sleeves



Running Board Mats

Patching Cement

Generator Tubing

Heel Plate Mats

Floating Flaps

### OVAL - FAN BELTS - FLAT

Many superior features are found in the Federal Blue Pennant super-service belt used on "V" or round pulley channels.

The core is built of highest quality endless cords impregnated with the best quality rubber friction; the same as in cord automobile tires. Wrapped in square woven duck with an extra thick cover of blue rubber compound which eliminates slipping and withstands grease, oils and dirt encountered in fan belt service.

A very flexible belt, which will not stretch, crack or break.

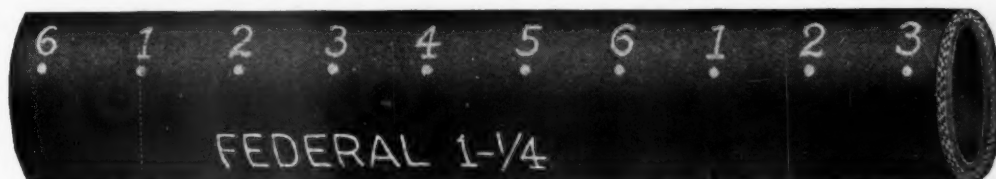
Packed 5 belts in a shipping carton.

Federal Flat Fan Belts are made of the best quality long-staple, square woven cotton fabric obtainable, thoroughly impregnated with a rubber compound of highest heat and oil-resisting qualities.

The wearing surfaces are coated with an extra thick layer of tough, oil, grease, and heat resisting rubber, similar to the tread stock used on Cord Automobile Casings.

The construction, and materials used, produce a flexible, stretchless belt which grips the pulleys without slipping, insuring a cool motor under the severest conditions.

Packed 5 belts to a package.



### BLUE PENNANT RADIATOR HOSE RED COVER - CALIBRATED

Blue Pennant Red Cover Radiator hose is built to give exceptional service.

The fabric insertion used in the supporting wall of this hose is of the highest quality square woven duck obtainable.

The inner tube is extra thick live rubber compounded to withstand the disintegrating effect of oils and anti-freeze solutions.

The cover stock is made of red rubber, and resists heat, oil, grease, and gasoline.

Adapted for use on circulating pump connections to withstand the heavy internal suction without collapse or breaking down.

For convenience of the trade our hose is marked in inch calibrations, eliminating extra measurements after size has been determined by referring to our standard chart showing the size of hose used on Passenger Cars, Trucks, and Tractors.

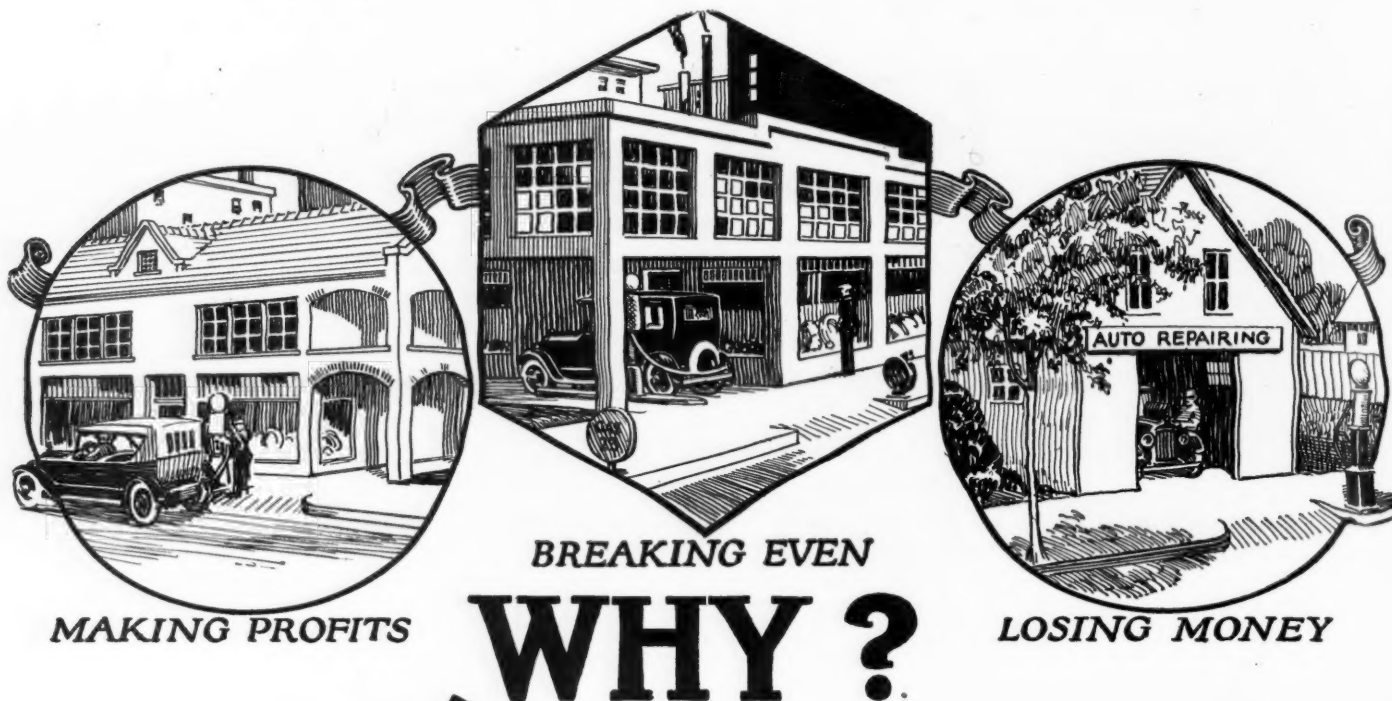
6 3-Ft. Lengths in Shipping Carton

Size Chart-Hanger Packed in Each Shipping Container

**FEDERAL AUTOMOTIVE RUBBER ACCESSORIES ARE SOLD THROUGH  
WHOLESALE JOBBERS ONLY**

**THE FEDERAL RUBBER COMPANY**  
OF ILLINOIS  
FACTORIES—CUDAHY, WISCONSIN





HERE YOU WILL FIND THE REASONS

**MOTOR AGE** has set for itself a definite mission. It is a business paper of the automotive trade and concerns itself with the greater success of those in this tremendous field.

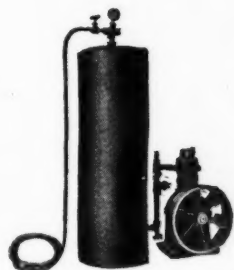
Among other important features, **MOTOR AGE** brings to its readers the fundamental reasons for success in the automotive trade. It tells why certain types of automotive merchants are successful and why others are not. It gets down to facts and specific reasons. It doesn't preach—it advises. As an influential factor in the progress of the automotive trade, **MOTOR AGE** has as one of its policies the belief that all of us can profit by the experiences of others. In every issue are found many valuable thoughts that were aroused by some dealer's experience.

Thousands of leading automotive dealers the world over are thus profiting by these weekly messages.

**MOTOR AGE**  
5 SO. WABASH AVE., CHICAGO, ILL.



## Satisfied Customers Are Regular Ones



Style "S"

Single Stage Outfit.  
Belted only. 5 sizes  
1-4 to 3 H. P.

THE MOTORIST (your customer) expects dependable free air service. If you have no air compressor or if you have one that is out of order half of the time—you are surely losing business. Most people don't kick—they just go elsewhere, where they know they can get real service. That's why you should use great care in the purchase of an air compressor—why you should select a Curtis—one that will render dependable service and will

not drive your patrons elsewhere in disgust.

Curtis Outfits are the result of 69 years manufacturing experience, 29 of which have been devoted to manufacturing pneumatic machinery. They are correct in design—are made in our own 17½ acre plant from the very best raw materials. They are original in design—embodying many exclusive features that assure long life and minimum upkeep.

### Many Styles and Sizes

We manufacture a complete line of single and two-stage, air and water cooled compressors—stationary and portable. There is a style, size and arrangement to suit your particular needs. Use the coupon for full information.

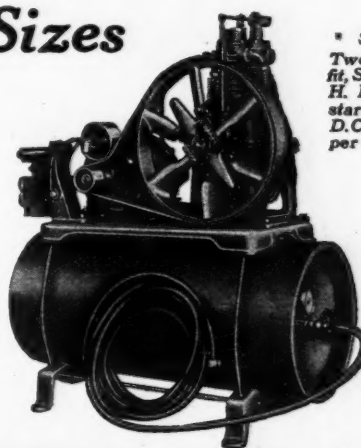


Style "X"

Portable Outfit. Belted  
or geared. 5 sizes. A. C.  
or D. C. Motor.

**CURTIS**  
PNEUMATIC MACHINERY CO.  
1527 Kienlen Ave., St. Louis, Mo. U. S. A.

Branch Office:  
530-H Hudson Terminal, New York City



Style "V"  
Two-stage Outfit,  
Sizes 3-4 to 2  
H. P. Automatic  
starter. A. C. or  
D. C. Motor. Cop-  
per Intercooler.

Send  
Coupon

Curtis  
Pneumatic  
Machinery Co.  
1527 Kienlen Avenue  
St. Louis, Mo.

Gentlemen:  
Please send me full details on  
Curtis Air Compressors, your  
proposition and prices.

Name.....

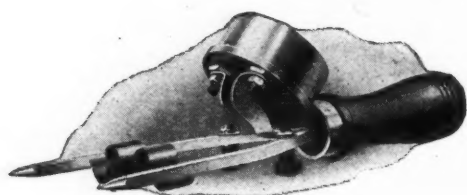
Address.....

Jobber's Name.....

Address.....

**CURTIS** *Single and*  
*Two Stage*  
**Air Compressors**





## QUICK SERVICE POSSIBLE

Your customer will appreciate an immediate answer when he asks, "How are my batteries?"

**YOU DON'T** have to stop the engine when using a Weston Heavy Discharge Battery Tester. Simply place two sharp prods on the positive and negative terminals of the cells—and read the answer to your customer.

Naturally he will come back when he gets service like that.

### Weston Complete Testing Equipment

- No. 441 "Fault Finder"—  
for utility use and general testing
- No. 443 Battery Voltmeter—  
for taking E. M. F. of individual cells
- No. 354 Dashboard Ammeter—  
Conceded to be supreme for accuracy  
and dependability
- No. 280 Testing Set—  
for every known electrical test

*The highest standard of service to car owners is possible only when you use testing instruments of accuracy. Complete information upon request.*

**Weston Electrical Instrument Co.**  
40 Weston Avenue, Newark, N. J.

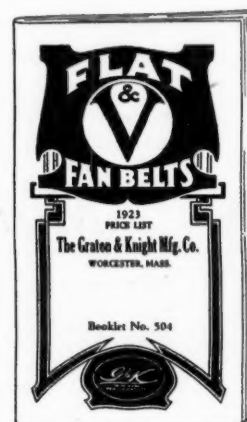
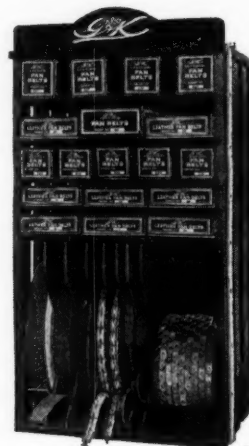
# WESTON

*Electrical Indicating Instrument Authorities Since 1888*

**STANDARD—The World Over**

## A Combination

that will keep the Fan Belts turning over. The new G & K Booklet No. 504 contains complete information and data about Fan Belts.

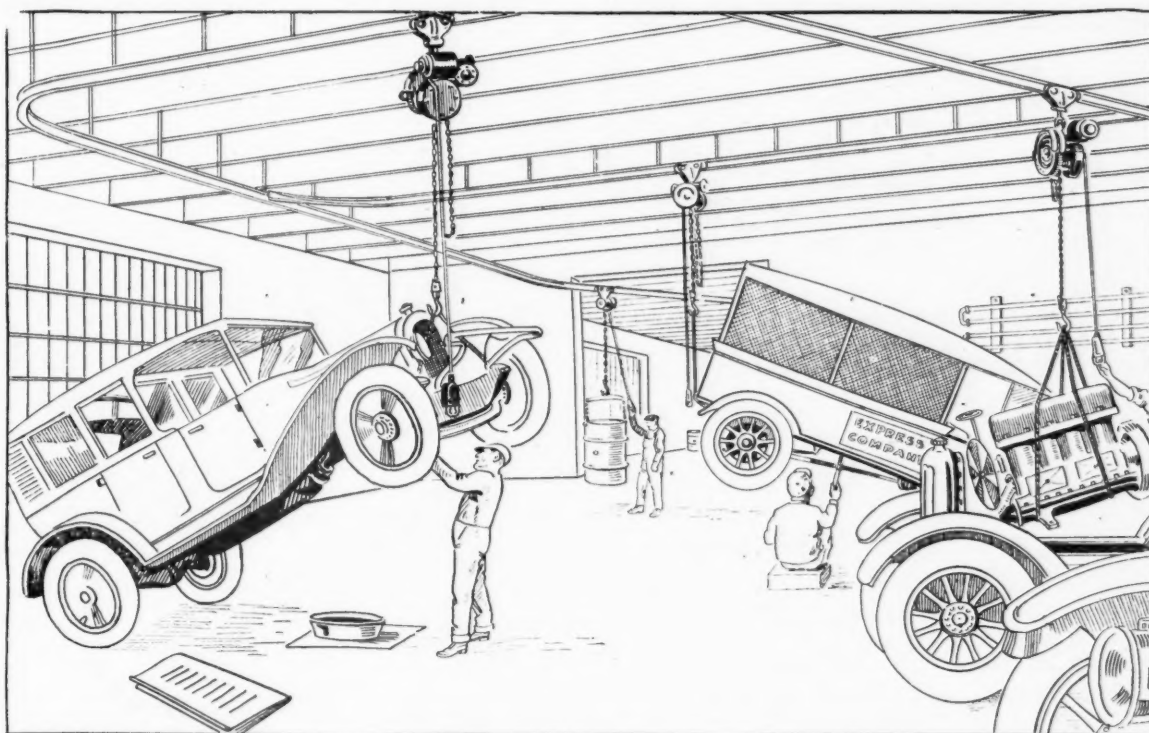


**Helps you sell G & K Leather  
Fan Belts**

**Real steer hide belts;  
natural color**

**The Graton & Knight Mfg. Company**  
Worcester, Massachusetts

*Automotive Division*



YOU Can Get New Profitable Business by Using—

## MOTORBLOC

“THE MOTOR DRIVEN CHAIN HOIST”

*for inspecting—cleaning and lubricating*

**M**OTORISTS like to “buy service” from shops which are properly equipped. They know that it means “good, quick work and right prices.”

MOTORBLOC makes it possible to render this new service to Motorists and IT IS NOW SAVING Auto repair shops time and money. It prevents lost motion and eliminates muscular effort.

MOTORBLOC enables one man to handle a Motor Car or Truck in many different positions.

### MOTORBLOC IS PORTABLE

and can be put in use, merely by plugging into an electric light socket,—just like a fan; in fact it consumes about as much current as an Electric Drill.

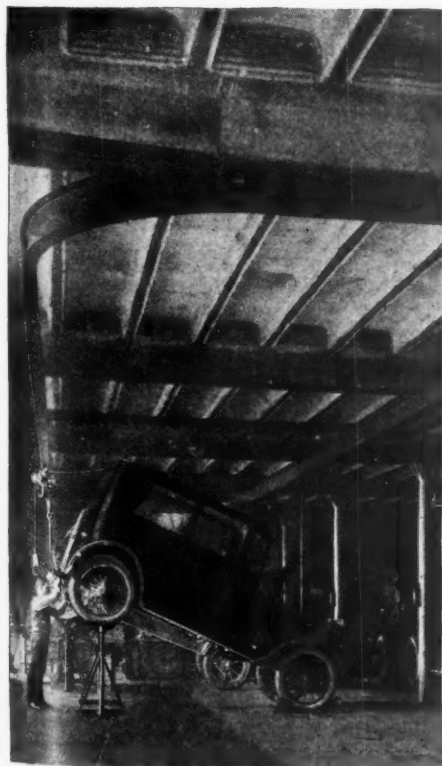
By the pull of less than a pound, a ton can be lifted to any height desired. The self contained pendant controller is operated by one hand, thus leaving the other hand free to guide the load.

For occasional lifts at points where electric current is not available, MOTORBLOC can be used as an ordinary hand chain hoist.

### IT OPERATES FOR LESS THAN 10c PER DAY

Repair shop work and profits, can both be increased by using MOTORBLOC.

Why not profit quickly by the experience of others, and let us “tell you how it can be done.”



Motorbloc being used in connection with rear axle and rear spring work in the modern garage of Howard Pierce, Inc., Butte, Montana.

**MOTORBLOC**  
CORPORATION  
SUMMERDALE  
PHILADELPHIA



**Findlay**  
**RIGHT-A-WAY**  
**VISIBLE DISPENSER**

**\$ .0000275+**

*At the  
 Vanishing  
 Point!*

IT takes a microscopic pencil to figure operating costs on a Findlay Right-A-Way Visible Gasoline dispenser.

The Findlay Right-A-Way will move 1800 gallons of gas from the storage tank into the automobile for less than one cent.

This isn't theory. It's been checked at filling stations again and again and one penny is the outside figure.

Figured down to a 5 gallon sale the cost of the delivery is so little that it runs out into almost invisible decimals. It costs \$.0000275+ to deliver 5 gallons.

And the beauty of it is that there is no depreciation to figure on the pump.

Are you interested in this new low cost of filling station operation?

*Write for catalogue.*

**THE VISIBLE  
 PUMP CO., Inc.**  
 FINDLAY, OHIO



**Show Your Customers  
 This Spring Lubricator**

**They will buy when they see it.**

Every automobilist knows that his springs work much better when oiled. But oiling is a dirty job—and he is looking for a way to do it without getting his hands and clothes dirty.

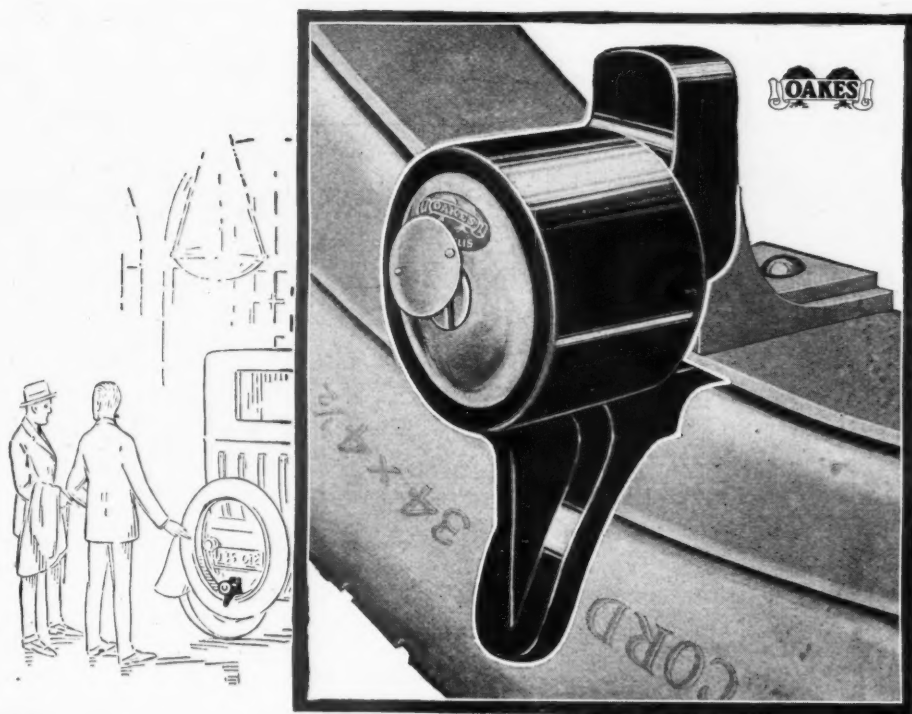
Jeavons Spring Lubricators are just the thing he wants. Show him how these covers keep his springs well oiled—how they keep the dirt from getting between the leaves, and how they prevent rust and squeaking springs.

Jeavons Covers are made of a SPECIALLY WOVEN BLACK ENAMELED DUCK OF HIGH TENSILE STRENGTH—a necessary requisite in order for them to properly lubricate and constantly do the work for which they are designed. Jeavons Covers conform to the lines of the spring. Unnecessary to remove spring clips when installing.

Just fill oil cap with oil. The wicking will then keep the leaves coated with a film of oil so they move freely and absorb the maximum of road shocks.

YOUR CUSTOMERS WANT RIDING COMFORT—and in furnishing them Jeavons Lubricators they'll get this comfort and you'll make a good profit. If you are not yet selling Jeavons Lubricators, start now and you will reduce your free servicing on new cars.

**THE  
 JEAVONS**  
 MANUFACTURING CO.  
 2540 PROSPECT AVENUE  
 CLEVELAND  
 OHIO



# Oakes Spare Tire Lock

*Easy to sell with a new car*

"80% of our new car customers buy Oakes Spare Tire Locks as additional equipment", say Simons-Wiles Motors, Buick dealers in Kansas City. Dealers in dozens of other cities say the same thing, "We're selling an Oakes Spare Tire Lock with nearly every car".

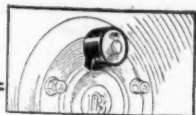
Get your share of this profitable business. Put an Oakes Lock on every new car you sell. Show the customer how securely this lock guards his spare tire against theft—how snugly it fits the carrier—how neat and smart it looks, and how easily it operates. You will make a quick sale and a nice extra profit.

Motorists like this lock because it gives greater protection than "make-shift" cables, chains, straps and padlocks, and adds a touch of distinction to the car. Made of unbreakable metal, with a high grade cylinder lock. Attractively finished—housing has glossy black baked-on enamel, lock face is brightly polished.

Order a trial dozen today for the car you sell, from nearest distributor, or factory. List price \$5.00 (Ford \$4.00). Liberal discounts.

*Oakes Spare Tire and Spare Wheel Locks are  
Standard Equipment on 19 Makes of Cars.*

**THE OAKES COMPANY, Est. 1910. Indianapolis, Ind.**

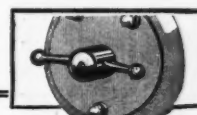


*for Spare Wheels  
with off-center studs  
this Oakes Spare Wheel  
Lock is just the thing.  
List price is \$5.00.*

#### DISTRIBUTORS OF OAKES LOCKS:

BALTIMORE—Catch Supply Company, Inc.  
BOSTON—Hartford Shock Absorber Agency,  
319 Columbus Avenue.  
BUFFALO—D & W Sales Co., 1471 Main Street.  
CHICAGO—Automotive Specialty Company,  
23rd and Indiana Avenue.  
CINCINNATI—Holmes and Curl Company,  
1131 Race Street.  
DETROIT—Rex Sales Co., 320 Piquette Ave.  
INDIANAPOLIS—Lilly Hardware Company,  
114-118 East Washington Street.  
LOS ANGELES—Charles L. Mead Company,  
1313 South Figueroa Street.

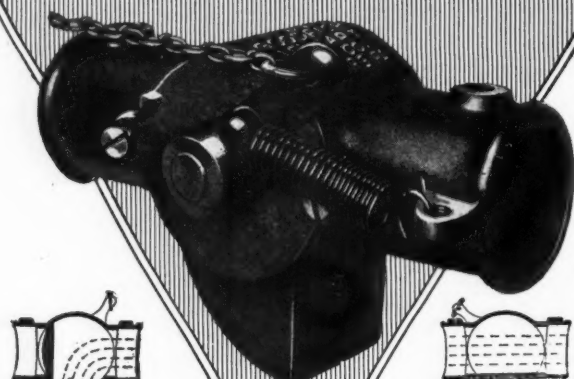
NEWARK—Hartford Auto Products Company,  
177 Central Avenue.  
NEW YORK—E. R. Waterman, 117 W. 63rd St.  
PHILADELPHIA—R. S. Sayer, 818 N. Broad St.  
PITTSBURGH—Axwell Equipment Company,  
240 Second Ave. and 280 Moorewood Ave.  
RENO, NEV.—M. R. Sloan, P. O. Box 471.  
ROCHESTER, N. Y.—D & W Sales Company,  
261 Central Avenue.  
SEATTLE—Ernst & Company, 1122 Pine Street.  
ST. LOUIS—Noser Sales Co., 2016 Locust Street.  
WASHINGTON, D. C.—Standard Auto-  
motive Supply Company, 1720 14th Street, N. W.



*for Spare Wheels  
with center locking  
studs, this type of  
Oakes Wheel Lock is  
ideal. List \$7.50.*



## It's the Goodrich Design that Car Owners Like



OPEN: the valve's heavy knife-like edge overcomes a great cut-out weakness. It shaves off all soot deposits inside the cut-out.

CLOSED: the valve fits snug and close. Cannot fit otherwise. No rattles. No escaping gas to cause annoyance.

# Goodrich MOTOR TESTING Valve

(Replacing Old Style Cut Out)

## Prevents Carbon and Soot—

A two-way revolving valve, in the Goodrich Cut-Out, has a knife-like edge that shaves the carbon and soot clear from the inner surface as fast as it collects.

This exclusive, patented feature keeps the valve always fit for action.

*It can't stick. It can't jam. It can't chatter or rattle.*

The Goodrich Motor Testing Valve is light in weight, accurately built, huskily made, snug fitting—and always ready.

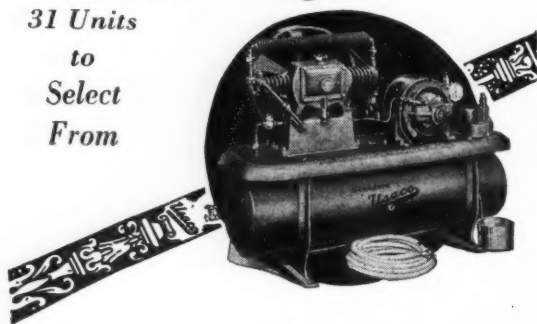
On test, the bell shaped mouthpiece produces a clear, sharp staccato note that reveals the exact condition of the motor.

Goodrich Valves are sold in the small size for \$3.00. Complete with pedal, pulley and cable. Larger sizes in proportion. Get booklet giving proper sized valve to use on any car. Write your jobber—or direct.

**Goodrich-Lenhart Mfg. Co.**  
HAMBURG, PA.

## Two Stage

31 Units  
to  
Select  
From



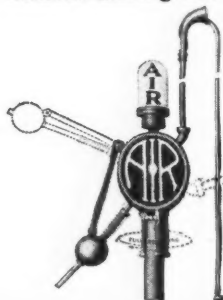
This illustrates the head of the Usaco "Perfect Balance" Service Tower which embodies many exclusive improvements.

It revolves easily on ball bearings without strain on tower, arm or hose.

The arm is in "Perfect Balance." After serving air it returns to vertical without the slightest strain and without lashing the hose. The absence of springs, oil checks and heavy weights assures long life with uninterrupted service.

The attractive light is water-proofed to protect against rain.

Write for a circular describing this masterpiece.



**THE UNITED STATES AIR COMPRESSOR  
COMPANY**

5304 Harvard Ave. Cleveland, Ohio

## For Compressor Satisfaction just say *Usaco* "u-say-ko"

For many years Usaco Air Compressors have led the field in filling station installations. Many companies have adopted them as standard.

Patented devices protect against changing current conditions. Automatic control assures continuous service without attention. High pressure service satisfies and makes steady customers. High standards in material and workmanship afford unprecedented long life.

To protect yourself in buying air compressors just say, "U-say-ko" and accept no substitute. Meanwhile ask us to prove why the Usaco is "By Far the Best by Every Test."



20 Units to  
Select From

**Single Stage**

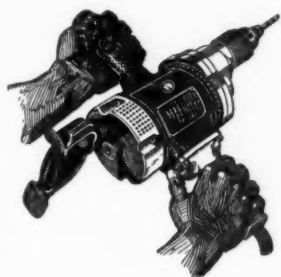


## UNITED STATES Portable Electric DRILLS

Jacobs Chucks  
Standard  
Equipment



## Profits—The Hole Answer



**H**OLES are part of every repairshop's business. So they deserve a place along with the other jobs that pay a profit. Why **SHOULDN'T** each hole you drill be reckoned as a revenue producer?

Make them with a U. S. Portable Electric Drill, and they will earn money—because you will make them so fast, so accurately and so easily that the saving in time, errors and fatigue alone will pay for the drill in a short time and thereafter put a profit in your pocket as long as you use it.

U. S. Drills are distinguished from others by their lightness, perfect bal-

ance, power, speed, ruggedness, ease of control (new under-the-finger switch), ability to stand the worst kind of abuse, and the total absence of freak features that give novelty but destroy efficiency.

Ball bearings. Air-cooled—never overheat. Universal windings—D. C. or A. C. at will: plug to any electric light socket. Double pole switch—you turn the drill on or off instantly without moving either hand.

Write for catalog 20-C

**The UNITED STATES  
ELECTRICAL TOOL CO.  
CINCINNATI, OHIO.**

District Sales Offices and Service Stations

Boston  
Chicago  
Cleveland  
Columbus  
Detroit

Houston  
Kansas City, Mo.  
Milwaukee  
Minneapolis

New York  
Philadelphia  
Pittsburg  
St. Louis

Complete stocks carried in all service stations





## Announcing the D-P Accelerator for Fords

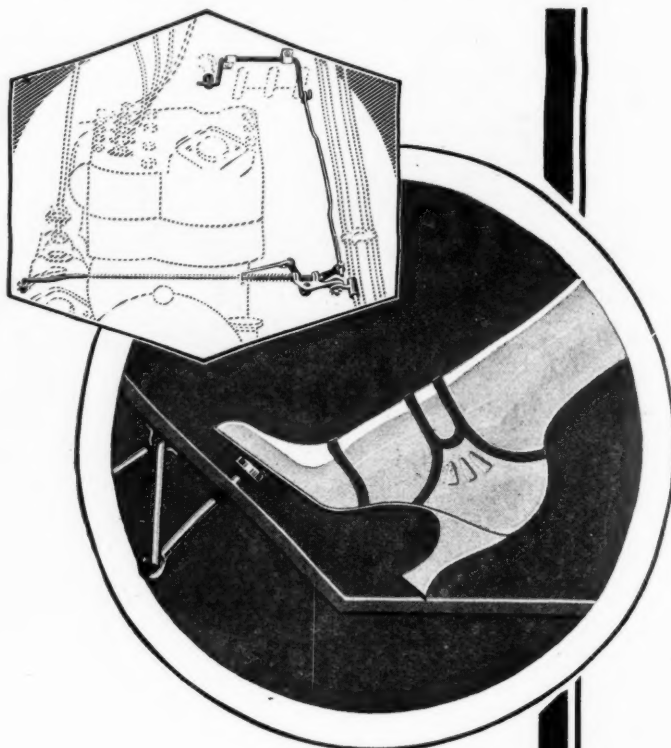
Here is a necessity for Fords that has sold so well we want every dealer in the country to get a share of the good, easy money it brings.

There is just one way to build an accelerator. The engineers designing expensive cars have found that out. We follow the same principles they do.

That makes it work so well that it stays sold, and makes every owner a salesman. You have no complaints and no service. You can install a D-P accelerator in ten minutes. The installation doesn't cut into your big profit.

Only one hundred selected Jobbers can handle D-P Accelerators. If your jobber can't supply you, ask us for the name of one who will. Do it now.

NOTE—A handsome demonstrating fixture goes with the first standard order. It surely DOES help move your stock. The jobber will supply you. Be sure you get one.



### DAVIS-PALMER COMPANY

4750 Sheridan Road,

Chicago, Ill.

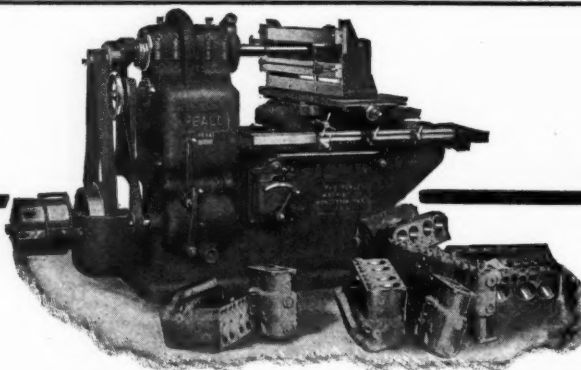
## Repairmen and Motor Owners Unanimously for the HEALD

THE REPAIRMEN choose the Heald for its economy in producing the highest grade of work. The Heald Universal Jig permits quick set-ups and accurate location of the cylinder bloc regardless of size or type. Simplicity of control eliminates lost motion and accurately graduated dials supplant guesswork. Every factor for cutting time from floor to floor is incorporated in the design and the minutes saved on every bloc show in dollars in the day's profits.

THE CAR OWNER demands Heald regrinding because of its efficiency and economy. A Heald-ground cylinder is as perfect as mechanical means can make it. 90% of all motor manufacturers finish their cylinders by grinding and use Heald machines exclusively. Naturally the owners will want the same grade of finish when regrinding in order to maintain the high standard of their power plant.

*If you are considering this work, visit several regrinding shops, get in touch with the manufacturers themselves, and finally question various motor owners as to what equipment they advise to handle this work so as to bring you ultimate success. Let us send you convincing literature or even give you a personal call. No obligation. Glad to do it.*

The Heald  
Machine Co.



61 New Bond St.  
Worcester, Mass.

# Warford

## AUXILIARY TRANSMISSION

**Warford, the six speed selective gear transmission for Fords, adds another ton to Ford truck one-ton capacity. Warford gives the Ford an UNDER-DRIVE under Ford low, for pulling power that nothing can stop. Warford gives the Ford an OVERDRIVE over Ford high for fast running without engine racing, which means cheapest empty runs.**



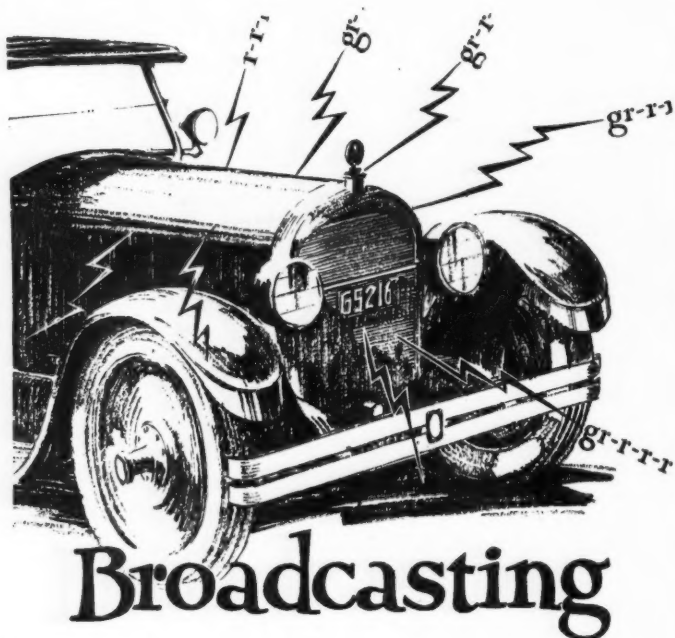
Timken bearings on both shafts, chrome nickel gears, and an aluminum housing are signs of thorough Warford quality.

**Warford Transmission is the only thing needed to make the Ford truck a 2-ton job that will actually outperform other big trucks costing hundreds and hundreds of dollars more.**

**No truck can do nearly as much so well, at the price of a Ford plus the low cost of the easily installed Warford selective transmission. The proof is waiting. Write to us about representation.**

**The Warford Corporation**  
44 Whitehall St., New York





When the front end begins to sound like a radio set on a night when the "static" is bad, it's time to put D. & B. Silent Timing Gears on the job. Then the motor will "tune up" in a quiet peaceful manner.



### The Original SILENT TIMING GEARS

These gears are made of a laminated fabric and gum combination. They are absolutely noiseless and always remain so. They are proof against oil, water and grease. They are as hard as metal and wear as long. They have three times the strength necessary. And they are the original silent timing gears—over three quarters of a million are now in use. Avoid imitations and substitutes—it's just as easy to get the genuine. Write for the name of the nearest jobber.



## Men Wanted

### to Handle the Sale of THE CENTAUR TRACTOR

—Built for the "One-Man Farm"

All replies to this Ad will be promptly acknowledged and the men selected will be invited to come to the Factory at the Company's expense.

The Centaur Tractor—the only All Purpose Tractor for the Small Farm—every small farm needs one—does not compete with the Fordson or other large Tractors—costs 8 to 10 cents an hour to run—New Way 5 H. P. Air Cooled Motor—Bosch Magneto—No Batteries—Guaranteed to plow 7" deep in clay sod. Ride while cultivating, discing, harrowing, etc. 13" Axle clearance—a portable power plant—belt pulley regular equipment. HAS REVERSE—BACKS UP ON ITS OWN POWER. Hyatt Roller Bearings—Automatic Governor—Multiple Disc Clutch—All Bearings Dust and Oil Leak Proof.

#### Distributor Basis—Liberal Discount

Discount big enough to permit engaging salesmen of highest type and calibre—and leave a more than satisfactory margin for the Distributor. Agricultural merchandise sales experience helpful but not essential. Our best producers never sold farm machinery before joining us. Market developed near towns and cities among Vegetable Growers—Gardeners—Orchardists and Small Land Owners.

#### Product Nationally Advertised—By Substantial, Progressive Manufacturer

Company furnishes leads—gives free sales training—carries all accounts. Proved merchandising plan insures quick action and substantial profits. No investment required—but Distributor must have finances to organize his territory. Stock of tractors can be carried without cash outlay.

Franchise open also to organizations now established that are looking for highest quality merchandise sold on money-back guarantee of satisfaction—with defective parts replaced free of charge throughout life of product.

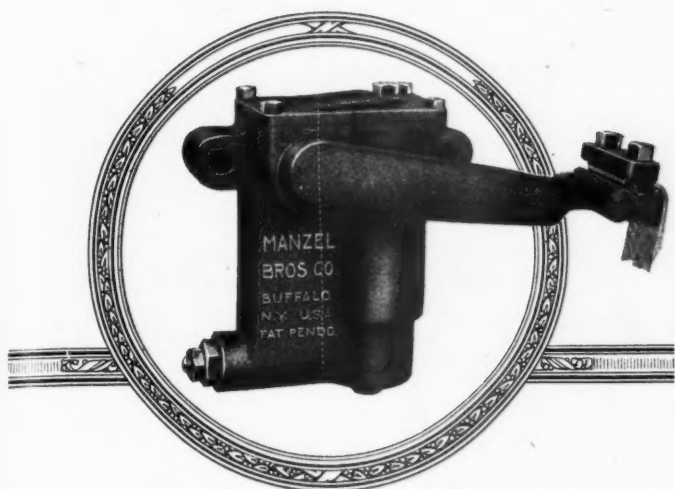
#### Write Fully Today —If You Mean Business

Our requirements are exacting—but the opportunity offered is truly exceptional. Write us fully—at once. All letters treated in confidence. Men selected will be invited to visit factory at our expense.

#### Territories Open in the Following States:

Indiana	Georgia	Kansas
Kentucky	Florida	Nebraska
Tennessee	Alabama	North Dakota
Western	Mississippi	South Dakota
Massachusetts	Louisiana	Minnesota
Connecticut	Arkansas	Wisconsin
Virginia	Missouri	Idaho
North Carolina	Texas	Colorado
South Carolina	Oklahoma	

**CENTRAL TRACTOR CO.**  
Greenwich, Ohio



## Sell the Shock Absorbers That You Can Guarantee to Give Satisfaction

Isn't it about time that you were able to recommend Shock Absorbers with the full conviction that they are going to back up every word you say?

Wouldn't you like to tell your customer that you can put a set of shock absorbers on his car that will bring an ease of riding, a gliding smoothness of motion beyond anything he has ever before experienced?

Wouldn't it pay handsomely to have him tell his friends that his car now rides smoothly over the roughest roads—that he never knows what it is to have a spring kick back at the body, and that it was YOU that brought him all this long sought comfort?

That is what "Manzel" dealers are doing. They are installing on their customers' cars "Manzel" Hydraulic Shock Absorbers, that automatically proportion their action to the size and severity of the bump, easing the springs down so gently that the shock is never felt.

And because of their exclusive design, rugged construction and automatic oil control, they are not subject to the wear and derangement common to the ordinary type of rebound controller, but will continue to give efficient service indefinitely.

"Manzel" Shock Absorbers do give efficient service and are guaranteed to give satisfaction in every way.

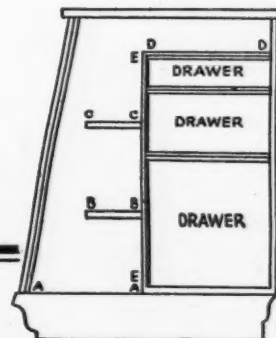
*May we send you full particulars?*

**Manzel Brothers Company**  
306 Babcock St. Buffalo, N. Y.

# MANZEL

HYDRAULIC  
SHOCK ABSORBERS

## twice!



### twice as much display!

Not only that, but after giving you twice as much display space for your samples the

### Sherer Accessory Display Case

also offers storage space for your entire accessory stock.

This case is offered in 3 standard lengths: 8 ft. 8 in.—12 ft. 2 in.—15 ft. 10 in. Put in the size that your stock and your display room call for and watch the sales grow.

#### inside show windows

The goods that they see are the goods that they buy. And in this case they are kept clean and orderly, under lock and key.

**SHERER-GILLETT CO.**  
17th & Clark St., Chicago

#### pays for itself

The profits on increased sales will soon pay the cost of this case, so that it really costs you nothing.

Write today and let our experts show you how to make the most pit of your salesroom.

Sherer Counters are found from coast to coast—we have been making them for 50 years.



Sherer-Gillett Co.  
17th & Clark St.,  
Chicago

Please send data  
regarding Case  
feet long.

Name .....  
Street .....  
City .....  
State .....



# CRANE PULLER

**Gets 'Em All**



The most stubborn wheel lets go when the Crane Puller is used. No fear of breakage—the Crane design and Crane materials make these pulling tools more than equal to their job.

Arms drop forged from high carbon steel, screw case-hardened with inserted tool steel point.

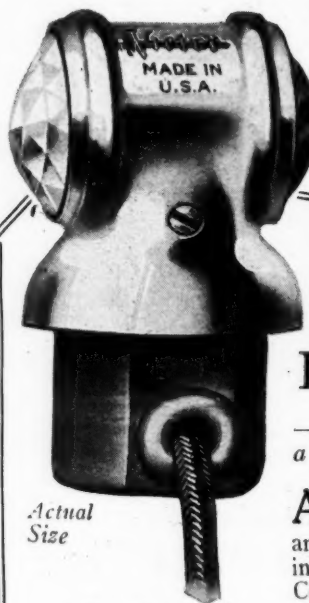
Three models, including the new universal Two-arm, Three-arm Crowfoot model, 4 sizes of each. Real tools for busy mechanics.

*Our 24-page folder gives you the whole wheel-puller story. Write for it.*

**CRANE PULLER CO.**

Arlington

Mass.



**Cincinnati  
Victor Firefly**  
(No. 45)  
**Parking Lamp**

**A Sturdy  
Parking Lamp**

*—made and finished like a piece of jewelry.*

A MINATURE lamp that is a little beauty. Strongly made and provided with a husky fastening nut that protects the wiring. Consumes a very minimum of current and casts an intensified light to front and rear through the white and red jewels.

Stock the Victor line of lamps and accessories for rapid turnover and profit.

THE  
CINCINNATI VICTOR  
COMPANY

714 Reading Road  
CINCINNATI, OHIO

*Actual  
Size*

The Victor No. 100 Spot Light in black enamel or all nickel is the ideal companion to the Firefly on a well equipped car.

Get the Cincinnati Victor Catalog.

**Victor**  
TRADE MARK

Owners, by purchase, of the Jobbers  
Division of the Corcoran-Victor Co.

## Garage Profits Increased with the AUTO-HONE

It is a cylinder grinding, reaming, boring and lapping machine—all in one.

Attach it to shop or electric drill. Pressure on stones is regulated from driving end of tool. As stones are forced out radially — AUTO-HONE centers itself.

The  
Service Station



Grinder and  
Cylinder Hone

PATENTED AUG. 9, 1916  
OTHER PATENTS PENDING

The  
AUTO-HONE  
Owner  
Will Sell More  
Pistons  
Rings and  
Pins

DON'T DELAY  
Be the AUTO-HONE  
Station in your vicinity.

DISTRIBUTORS EVERYWHERE

*Write today*

**THE AUTO-HONE CO., INC.**  
1587 Main St., Buffalo, N. Y.

**For Best Results Use—**

TRADE  
**TENAX**  
MARK

"The Original Blue Sheet."

**Compressed Asbestos  
Sheet Packing**

For twenty years, practical engineers and men in mechanical work have been buying and boosting Tenax. Famed for its splendid performance and long life. The old reliable sheet packing that never varies and that men know to be good.

Over 400 leading jobbers handle Tenax. Small samples on request.

"The Original Blue Sheet." In size 50x50 in. from 1/32 to 3/4 in. thick. Also, in black graphited sheets 1/64 in. thick.

**Advance Packing &  
Supply Co.**

66 E. Lake Street, Chicago

# One Quality Terminal for All Your Customers

Will take a 3/8 inch or 5/16 inch taper plug from any position or angle.



To install, simply fasten ALL-IN-ONE terminal to cable in manner illustrated—then slip terminal over battery post and screw nut up tight. To take terminal off battery post, simply loosen nut and tap on end of thread slightly. The terminal can then be lifted off. Bronze heavily coated electrolytically with pure lead—long life and satisfaction assured.

Patent applied for.

## OHIO

WISE TYPE

## ALL-IN-ONE

### STORAGE BATTERY TERMINAL

By stocking exclusively the Ohio All-In-One terminal, you can reduce your investment, increase your turnover, make a larger profit and have better and more satisfied customers.

Ask your jobber—he stocks them.

### The Ohio Parts Co.

3307 Colerain Ave.

Cincinnati, O.

If You See (P) They Are (K)

O-P

O-K

**Get This—The Bull Dog checks the rebound without stress or strain on any part of the car.**



## BULL DOG

### BOUNCE ABSORBER

For All Cars

"The one you will eventually sell"

**New Special Model for STAR, CHEVROLET, BABY OVERLAND**

Price complete with all necessary fittings.....\$18.00

**Model 3 For Fords**

Price complete with all necessary fittings.....\$15.00

The absorber you will eventually sell because of its incomparable efficiency and effectiveness. Write your jobber today for details and discounts, if he doesn't carry it our sales department will give you the name of one near you who does.

Manufacturers  
**CHANNON-HUGHSON**  
229 W. Erie Street,  
Chicago, Illinois

Sales Department  
**THE ZINKE COMPANY**  
1323 S. Michigan Ave.,  
Chicago, Illinois

# Replace with Atlas

Point out the big features of the Atlas radiator and you will invariably make a ready sale. The special tube construction of flexible brass gives a tripled cooling capacity in summer and in winter expands with freezing water without bursting. Then the backbone. This is a heavy rigid bracket of

steel that supports the radiator and reinforces the car frame. The Atlas is a money-saver. It fits into the original shell—that's economy for the customer but the discount is long and that's profit for you. Your jobber stocks Atlas radiators for quick delivery. Ask for details today.

Big profit  
Sells all  
Seasons

Beautiful  
finish  
Efficient  
service

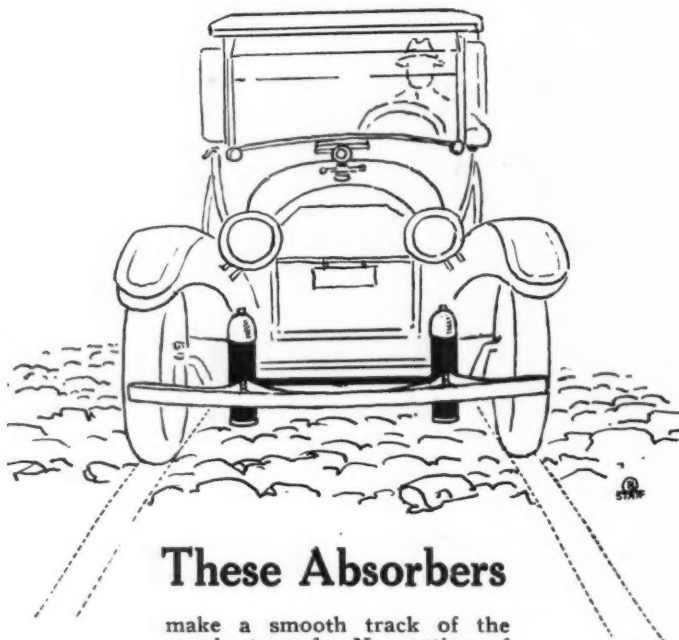


## The ATLAS RADIATOR for FORDS

"The Radiator with a Backbone"

Made by STEIDLE MFG. CO., Cincinnati, Ohio

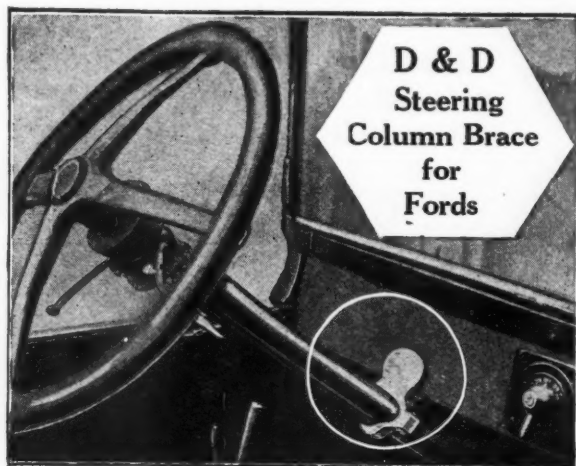




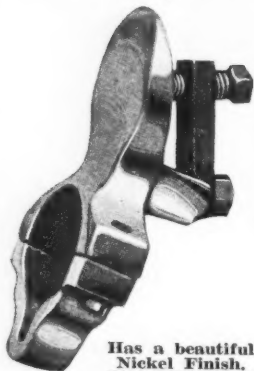
## These Absorbers

make a smooth track of the roughest road. No cutting of frame—no grief—no side sway—just an honest to goodness absorber.

Want our literature?



## D & D Steering Column Brace for Fords



Has a beautiful Nickel Finish.  
List Price \$1.50

Every Ford owner will thank you for showing the D & D Steering Column Brace for Fords to him, for it will absolutely eliminate all steering wheel wobble and vibration over the most severe roads.

This strong arm made of alloy of aluminum and steel can be installed on a Ford in two minutes without any drilling or boring. Adds comfort to driving. Order a dozen from your favorite jobber and watch how fast they go.

Manufactured by  
**L. H. Daley & Co.**  
Columbus, Ohio

## ACCURATELY MACHINED DALL SEMI-STEEL REPLACEMENT PISTONS ACCURATELY MACHINED



For replacement work after a rebores or re-grind job insures your customer as good if not a better job than the original assembly.

Dall Pistons are simply GOOD Pistons, made to manufacturer's specifications, sometimes more refined in design and lighter in weight, but always as carefully made and inspected as though they had to pass the most rigid inspection of a Motor Manufacturer.

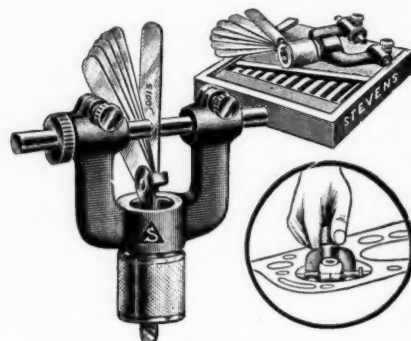
Dall Pistons are regularly furnished in standard and various oversizes, also semi-finished 1/16 oversize.

Write today for price list and delivery schedule on all items. Distributors at various points will take care of your requirements.

## THE DALL MOTOR PARTS COMPANY

Post Office Station D, Cleveland, Ohio  
Southwestern Branch  
**THE CARROLL CO.**  
2218 S. Harwood St., Dallas, Texas

## Pistons Pumping Oil?



OIL pumping is only one of the comebacks caused by fitting pistons and rings **without accurate measurements**. Do you know if the piston is worn, if the cylinder is out of round, if standard size rings will fit? If you don't you're risking your reputation. Any mechanic can take definite measurements with **STEVENS MICROGAUGE**. The opening between its fixed pin and its adjustable pin shows the exact oversize which is measured with a thickness gauge, precisely and easily. List price: T-504, with ten pins, \$5.00; T-500, with one pin, \$2.50. Stop guessing—get **STEVENS MICROGAUGE** today. Write for Catalog 105-J, showing the 95 Special "Speed-Up" Tools.

## Stevens & Company

375 Broadway

New York City

**Stevens** *SPEED UP* **Tools**

10c  
a spring  
up to  
4 in. bore.



15c  
a spring  
over 4 in.  
bore

## Keeps Piston Rings Tight In The Cylinder

The Seney Expansion Spring fits in the grooves of the piston in back of the piston ring and in many cases eliminates the expensive job of reboring the cylinders. With a set of these springs you do not need over-size pistons or over-size rings. Springs are one piece tempered so that heat will not affect them, thus giving permanent

uniform tension. They will overcome leaky and weak piston rings and give the motor the proper compression, by preventing oil passing in the cylinder head and escape of gas in the crank case.

Note the prices above and order direct, giving year, model and make of car.

**Seney Expansion Piston Spring**  
237 Cannon St., Bridgeport, Conn.

## SPENCER-SMITH PISTONS



Largest Manufacturers  
of

**Pistons  
Exclusively**

**SPENCER-SMITH MACHINE CO.**  
HOWELL, MICHIGAN (28)

**DE LUXE  
Products**  
for the Motorist's Comfort



A single trial of the  
DeLuxe proves more  
than a page of print

**ORDER DIRECT  
SPECIFYING  
JOBBER**

*The*  
**DeLuxe**  
TIRE PUMP

Also  
ARVIN HEATERS  
DE LUXE,  
DE LUXE VENTILATORS

**INDIANAPOLIS PUMP & TUBE CO.**  
INDIANAPOLIS

## Replace Cast Iron Flywheel Teeth With **EXCELSIOR** Steel Ring Gears

Replacing a whole flywheel because of broken or battered teeth is costly and does not prevent a recurrence of the same trouble.

Machine off the stripped teeth and shrink on an Excelsior Steel Ring Gear. It will fit and mesh perfectly with the starter pinion on any American car or truck specified.

Made of S. A. E. 1035 steel with the teeth cut and chamfered to the correct diameter and pitch to insure quiet and smooth operation. Each gear is weld tested under hydraulic pressure. Order through your jobber. If he cannot supply you, write to us.

**The Springfield Mfg. Co.**

221 West Main St.  
Springfield, Ohio





## SELL "TASCO" \$1.25

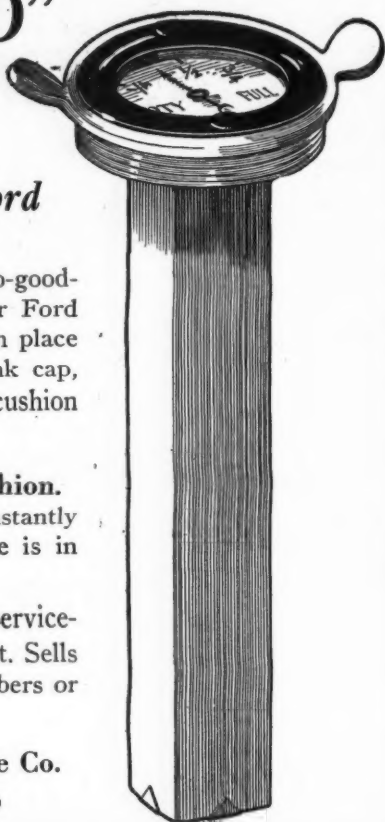
*There's one  
for every Ford*

A real, honest-to-goodness gas gauge for Ford cars. Screws in in place of regular gas tank cap, right under the cushion seat.

**Just lift the cushion.**  
"Tasco" tells instantly how much gasoline is in tank.

Quick, accurate, serviceable and convenient. Sells fast. At your jobbers or write direct.

**The Akron-Selle Co.**  
Akron, Ohio



TRADE MARK  
Reg. U. S.  
Pat. Off.

**Y  
A  
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E**

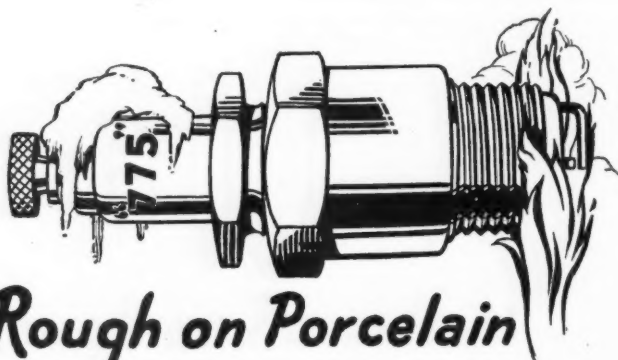
## Distributors

Here's something your men can sell in quantity (and almost at sight) to every garageman they call on. Two men travelled the length of the Santa Fe trail, and sold every dealer along the way. Now we are getting repeat orders from a big percentage of those dealers. The proposition we offer runs into big monthly money, and heavy repeat business. Send for the complete details, and don't lose time. Your territory may be closed while you consider.

## Roland & Koch

411 S. Main St., Los Angeles, Cal.  
2715 N. Broad St., Philadelphia

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## Rough on Porcelain

Try this on your wife's fine china. Put ice on one side and turn a flame on the other. Raise it from zero to boiling temperature in one minute. That's about what a spark plug insulation has to stand, and if it cracks the plug is done for.

There's special porcelain specially fired to withstand these temperature changes. Manufacturers can tell it at a glance, because every insulator made of it carries the figures "775."

Is there a "775" on each of your plugs? You needn't pay any more for plugs that have it. Take a look at them, and remember the number when you buy new plugs.

**Frenchtown Porcelain Company**  
Trenton, New Jersey



**STANDS THE TEST**

"Established in 1910—  
Busy Ever Since"

**W**HEN ALL advertisers demand their money's worth, all publications will provide circulation reports verified by the Audit Bureau of Circulations.

It is one of the mysteries of the advertising world that while all manufacturers demand verification of weight and quality in the material purchased, some of them still buy advertising space without knowing what they are paying for.

Such advertisers, however, are now exceptional. Most of them demand verified A. B. C. circulation statements before placing contracts.

In the case of MOTOR AGE, the demand is immediately met.

It is a member of the Audit Bureau of Circulations.

**With Only City Gas as Fuel  
No Forced Air Blast**

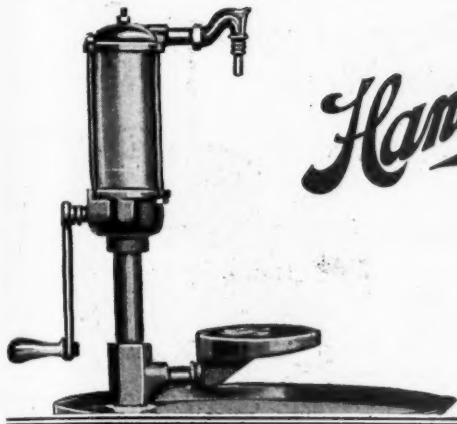
**The No. 101**

**JOHNSON Bench Furnace**  
**Has Proven the Best**

For

**Any Bench Work Requiring Heat**

**JOHNSON GAS APPLIANCE CO.**  
Cedar Rapids IOWA



**Handy Ben**  
TRADE MARK

**VISIBLE  
Oil  
Pump**

**M**Y NEW VISIBLE OIL PUMP is doubling oil sales and profits for users—In fact:—day after day letters keep coming in from trial customers stating that they wouldn't be without it.

You can imagine the talk my **HANDY BEN** grease pump is creating in easily passing the 10, 15 and 25 barrel mark in year 'round weather. My Visible Oil Pump is only \$14.75. My Grease Pump — only \$12.50. Special Barrel Truck, \$6.50. Order one of each **ON TRIAL** at my risk.



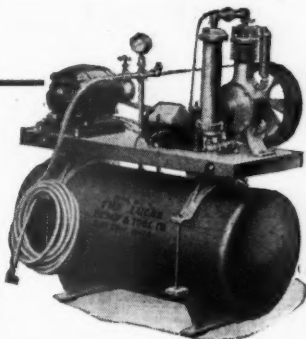
*Bennett*  
PRESIDENT

**BENNETT INJECTOR COMPANY**

Inventors and Manufacturers of Grease and Oil-Handling Devices  
MUSKEGON, MICHIGAN

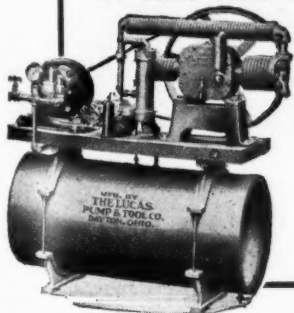
**More Money  
In Air**

Any Air Service that is as good as your competitors' makes you money—it is part of the service your customer expects for "full measure." But the garageman who is a good business man is not content with just-as-good-as Air Service. He wants an air compressor that will help to make his service better—that will help bring him more customers.



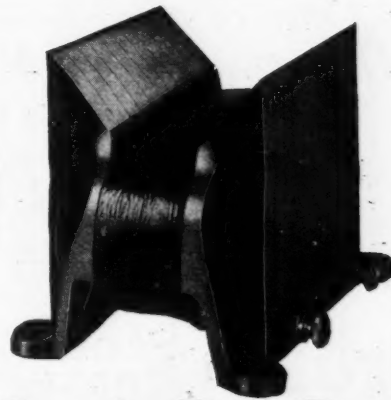
**DAYTON SINGLE &  
TWO STAGE  
AIR COMPRESSORS**

DO THAT VERY THING—at the lowest costs. The remarkable simplicity of design not only makes their operation quick, dependable and efficient, but it allows a low first cost and cuts operating cost by taking less power, less oil and fewer repairs. Let us tell you more about the Dayton—send today for the catalog



**The Lucas Pump &  
Tool Co.**

128 Valley St. Dayton, Ohio



**This Growler Costs But \$4.50**

With it you can tell in ten seconds whether an armature is in good condition. If it is not, you are saved all the grief of having to do the whole job over, losing all your profit and the customers' goodwill besides. Operates on 110 Volt A. C. Current.

Sold direct or through your jobber. Resale price \$4.50 in Central and Eastern States, \$5.00 in Pacific States. Your check for above amounts plus twenty-five cents postage brings this moneymaker to you.

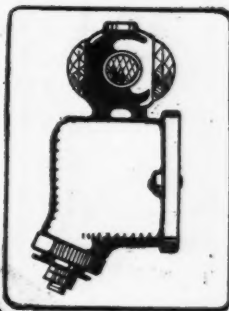
**ARMATURES:** We rewind any and all kinds of Generator, Motor, and Magneto armatures with professional help. No students or free help in our shop. Our armatures start generating at low speeds and keep the battery charged. "Short Changed Windings" will not. Have established a National Reputation for Quality Products and **SAME DAY DELIVERY.** Write for Price List.

**Armature Rewinding Co., Inc.**

3537 BELL AVE., ST. LOUIS, MO.

After Sept. 1, in New Factory 3301 Washington Blvd.

List  
\$6.00  
Complete



**Complete Protection—  
Day and Night—Against  
Collision**

**Parking Lamp** (same as above, without signal) \$2.50

**Signal** (same as above, without Parking Lamp) \$3.25

**Junior Combination, Signal and Lamp — Brass, Nickel Plated,** \$3.25

**Spot Light, 4" Silver Plated, Parabolic, Reflector,** \$3.50

The new "Helmet" Combination Signal and Parking Lamp is so practical and attractive that it is a compliment to any car.

Shell of light, polished, cast Aluminum; word "STOP" (1½" x 3½") flashes automatically with brake application; Parking Lamp shows brilliant Ruby, Green and White; nothing to loosen or become detached.

Easily attached.

Write for discounts, etc.

**WILLIAMSON MANUFACTURING CO.**  
Govans, Baltimore, Md.



## Every One of Our Dealers Makes Money

In the first place, we have only good dealers.

In the next place, we give him a good product, a liberal discount, exclusive territory and sales assistance. A good man can't help making money.

Englert Manufacturing Co.  
Pittsburgh, Pa.

**Dragon Storage Battery**



The Bearings Company of America, Lancaster, Penna. Angular Contact Thrust Bearings. Angular Contact Radial Bearings. Manufacturers of Thrust Ball Bearings of all types. Let our Engineers help to solve your Bearing problems.

The Bearings Company of America,  
Lancaster, Penna.

Detroit, Mich., Office,  
1012 Ford Bldg.



## PAROB EXPANSION HAND REAMER

BLADES CUT AT DIFFERENT ANGLES

Each successive blade cuts AT A DIFFERENT ANGLE from the one before it.

No CHATTER, no DIGGING IN—even in keyed holes.

TWICE the expansion of others. All sizes. Money-back guarantee.

Ask about the GAMMONS TAPER PIN REAMER—Wonderful Time-saver.

THE GAMMONS-HOLMAN CO.

Dept. C.

Manchester, Conn.



### Negligible Upkeep

High performance standards of the new Waukesha Bus and Truck Motor radically reduce operating costs and continuously keep them at the minimum.

Write for details.  
The Waukesha Motor Company  
Waukesha, Wisconsin

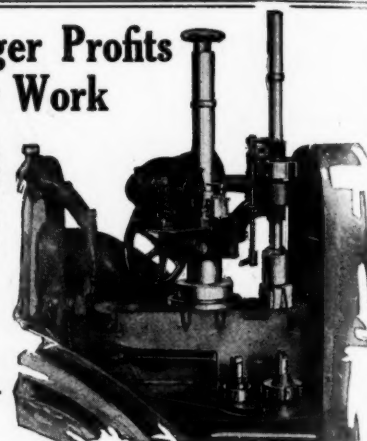
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TRADE MARK  
**BUS and TRUCK MOTORS**

## Make the Bigger Profits In Cylinder Work

With a Model S Portable Stormizing Machine. First cuts a new, true, cannon-bore straight cylinder, then gives a perfect gun-barrel finish. Portable, automatic and self-centering. Renews and Refinishes all cylinders from 2 1/2 to 4 1/2 in. Write for Stormizing Book describing all models.

**STORM**

MANUFACTURING CO.  
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Best for Automotive Work

We carry at all times a complete stock of every kind of cable used for automotive work. Many years of specialization have brought **PARANITE** Cables to the highest state of perfection. The finest grades of rubber compound, cotton and flexible enamel varnish are used.

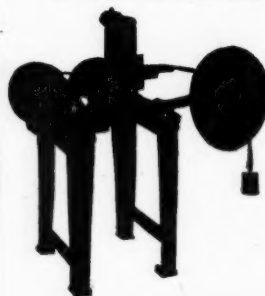


FOR 33 YEARS THE STANDARD  
IF IT'S **PARANITE** IT'S RIGHT  
Quality jobbers handle quality cable—that's **PARANITE**.

Indiana Rubber & Insulated Wire Co.

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Make your own radiator cores and save 20% to 50% of their cost, give your customers quick service and a better core for less money. No need to carry large stocks of cores, and no damage in shipping. Increase your volume of business. Send for illustrated booklet describing our radiator core equipment.

Write for information to

**Radiator Engineering Co.**

626 Nesselwood Ave.

Toledo, Ohio

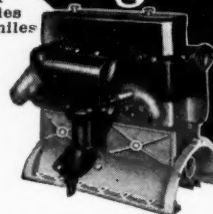
## Every Ford Owner needs

RAJO power, RAJO flexibility, and RAJO economy. All of the advantages of valve-in-head, 3 to 40 miles per hour in 16 seconds. 60 miles per hour from standard Ford models.

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It's Easy. RAJO Valve-in-Head pays for itself every season. Easier to install than grinding valves—Use Ford Head Bolts—No cutting of dash—Nothing to move.

**pays for itself in gas saving alone**



**now only \$57.75**

Get our complete proposition. Put a "RAJO window" in your store.  
**Rajo Motor Co.**  
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**RAJO**  
VALVE-IN-HEAD FOR FORDS

**Effective!****Harmless!**

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You can't nurse a grouch when Pontoklene's within reach. Pontoklene removes tar and grease absolutely, without injury to the finest automobile body finish. It brings a smile to Mr. Auto Owner when he sees the spots disappear and the original lustre shine out. Order from your jobber today. Retails at \$1.00 a can.

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Our latest catalog describes this and our other models. Write for a free copy.

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Why waste the time of three or four men on heavy lifting jobs when one man can do it better and quicker with a CANTON Portable Crane & Hoist? Hundreds of service stations and repair shops all over the country are speeding up work, saving time and preventing costly accidents with this piece of equipment. You can do the same in your shop.

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New York Office, 203 E. 15th St.

# CANTON

PORTABLE

# CRANE & HOIST

## The Ultimate Way WET INTERNAL GRINDING

Wet grinding, as made possible by the Micro Internal Grinder is as far in advance of ordinary dry grinding as the present day automobile is over the old ox team.

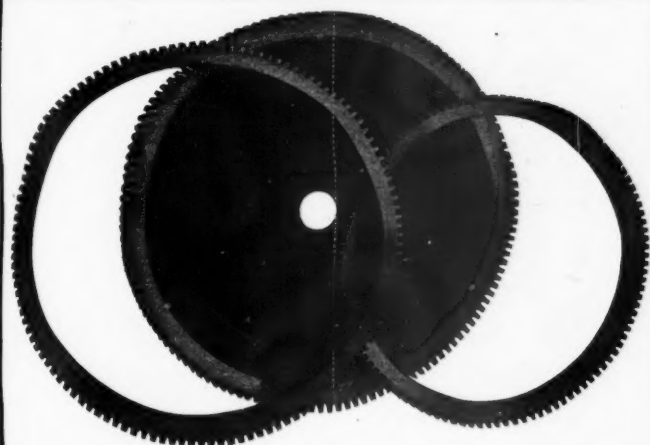
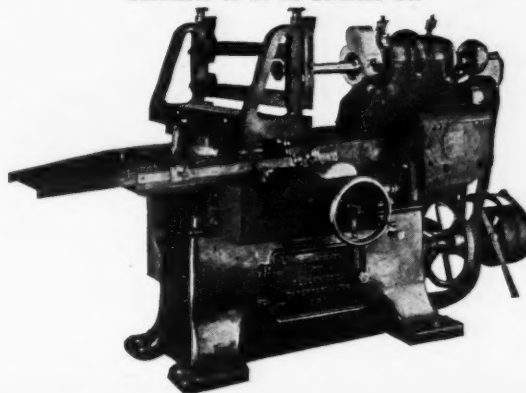
# Micro

The Micro is a highly developed type of internal grinder adaptable for either wet or dry grinding, at the option of the operator, permitting highest quality of results. Its automatic action, both as to cut, feed and table travel provides the most accurate work humanly possible in exceptionally quick time.

If you're going to get a grinder, get the kind that will pay you biggest returns. Our bulletin gives full information—send for it.

**MICRO MACHINE COMPANY, Bettendorf, Iowa**

Successor to B. L. Schmidt Co.

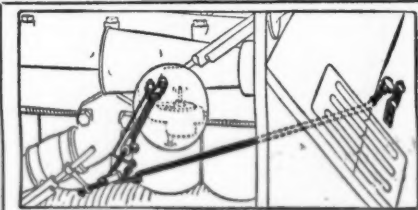


## New Low Prices On Fly Wheel Rings

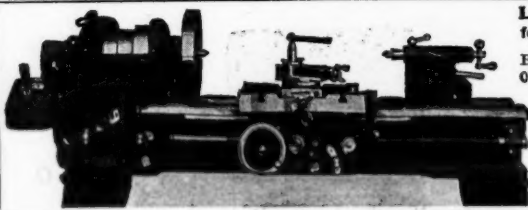
Increased quantity production has enabled us to get out a new and lower price list on Meachem Steel Gear Rings for Fly Wheels. Also our trade discounts have been increased to more than offset the lower list prices. Write us for the new list and discounts.

**The Meachem Gear Corp'n.**  
Ring Dept. Syracuse, N. Y.






**THE GREEN LINE FOOT ACCELERATOR**  
Quickly installed, no bolts to remove. Action is easy and positive. Works free from hand throttle. Floor boards can be removed without disturbing Accelerator.  
Write for full particulars.  
Price ..... \$1.25  
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Be sure to get our Special Prices.  
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"The only oil ring with a mileage guarantee"  
"Sav-Oil" is stamped on bottom of every ring  
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Fan Belts and Radiator Hose  
"Leaders in the Industry"

THE GRAND PRIX CAR  
**DUESENBERG**  
Original Straight Eight  
Duesenberg Automobile & Motors Co., Inc., Indianapolis



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Adjustable. Two sizes will clamp any hose of any diameter. Made from cold rolled steel out of wire. No rough edges to cut hose. Put on in less than a minute. Everlastingly leak-proof. Order Universal Hose Clamps. Trademark on every clamp and carton. Get them from your jobber—or write us.  
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Electrical Testing Equipment  
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Branches:  
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**THE RAYBESTOS COMPANY**  
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Taps, Dies, Cutters, Drills, Reamers  
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Makes riding and driving a pleasure. Eliminates road shocks and hard steering, spring breakage, shock absorbers. Write for our money making dealer proposition.  
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The "UNEEK" and "OTIS"  
Hose Clamps  
are in a class by themselves  
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**MILWAUKEE BEARINGS**



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A mean job—removing and replacing piston rings—now made easy by Wonderspread, the remarkable tool that grips the ring and then SPREADS it. You just use it as you would a pair of pliers—all one motion.



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**\$2.50**

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Monarch Valve Grinding Compound, "The Quality Compound" since 1907. Packed in 4-oz. boxes—2-3 coarse, 1-3 fine—List 50c.

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**SELF-ALIGNING BURNISHING MACHINE**

Makes it possible to fit over-size pistons without removing engine from the car when the variations do not exceed 5/1000 of an inch. Cylinders slightly tapered, out of round, or with shoulders worn by pistons or rings may be made round, straight and true. Price \$25. 12 ounce can Red Devil Compound, \$1.50. Write for complete details.

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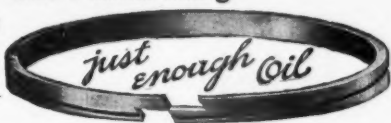
## WICACO Twin Cut Piston Ring—

*With the Wandering Oil Groove*

**[pronounced WICK-A-CO]**

**WICACO**

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NOW YOU CAN HAVE

## THREE-SPEED Transmission

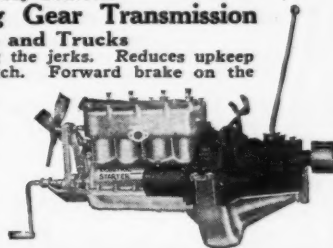
A three-speed forward, one reverse and replace the regular Ford Transmission, drums, bands and all—the low speed lower than the Ford low, therefore more power, the third or high is the same as the Ford high, and second is half way between.

## Cronk Simplex Sliding Gear Transmission

*For Ford Cars and Trucks*

Saves rear axles by eliminating the jerks. Reduces upkeep on engine. Multiple disc clutch. Forward brake on the jack shaft outside of case. Ruggedly built with oversize alloy steel gears, Hyatt Roller and Genelite Graphite-Bronze bearings. Installation easy. No cutting or machining. Write today for other interesting details.

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We Re-babbitt any Automobile, Truck or Tractor Connecting Rod or Main Bearing with HIGHEST GRADE NICKEL BABBITT and finish them regular Factory sizes. All work guaranteed satisfactory or money refunded in full and transportation paid both ways. All RUSH Orders shipped same day order arrives.

We shipped over 100,000 Bearings last year. Over 5000 satisfied Dealers and Garages will recommend us. Save one-third to one-half your Bearings costs by sending us your work. Ship Parcels Post or Freight. We sell wholesale only.

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*—accounts for every labor minute*

Prints the year, month, day, hour, minute, A. M. or P. M. at the exact moment the plunger is pressed—like this, for example:

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Tells when a job is started—and when it is finished. There can be no dispute over the time charge.

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Learn the interesting details from our descriptive data.



**MORE-POWER GREATER MILEAGE**

Engine POWER and Gasoline MILEAGE Depends on Proper Combustion  
Proper Combustion Depends on Proper Ignition

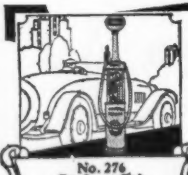
**TWO-PLUG IGNITION IS THE SOLUTION**

What is Two-Plug Ignition?—It is two plugs sparking simultaneously in each cylinder, at opposed points. What does Two-Plug Ignition mean?—It means the instantaneous burning of the gas, which is more power. It means the complete burning of the gas, which is increased mileage. This system can be obtained with SU-DIG Series Plugs without any change in the system of wiring or ignition equipment and at an expense of only one additional plug per cylinder. Interesting booklet on "How to Get More Power" Sent free on request.

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CURES RUSTY SQUEAKY SPRINGS


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Nine body types,  
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VALVE-FACER

Works like a pencil sharpener. No chatter-marks; a finish equal to any lathe job—in a few minutes. Does a real job. Built by TOOL-MAKERS. Circular.

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Gasoline Gauge

for Fords and Chevrolets  
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Electric or hand operated. Five or ten-gallon full visible pumps. Ten models visible pumps, twenty models roadway and oil pumps.

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Let us send you our FREE Catalogue on

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Fly-Wheel GearBands

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MOTOR TRUCKS *for low-cost hauling*


Models range from the 2,000-lb. Speed Truck to the 10,000-lb. truck. Some territory is still open for dealers.

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"EVERLASTING PERFORMANCE"

Engine Sealed and Guaranteed for 2 Years


**R & V MOTOR COMPANY** East Moline, Ill.



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**THE JACOBS MANUFACTURING CO.**  
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One Dealer Sells 125 in One Month

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Fits any windshield. Made of sapphire blue scientifically made optical glass. Driver looks through it and is relieved of all eye strain from oncoming head lights, sun glare, snow glare and road glare. Price \$3.50. Territorial distributors, dealers and agents wanted.

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Pass I. E. S. rules and all state tests.

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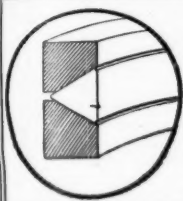


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FLOAT THE CAR ON AIR

Promotes smooth, joltless riding by cushioning all road shocks. Positive two-piston action against air pressure and oil. Easily installed and permanent in operation. Big profits for live dealers and distributors.

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BELTING and HOSE COMPANY

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Both cushions the impact and checks the rebound.

Made by

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With the Explosive Spark

THE T. N. T. SPARK PLUG CO.  
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You Sell

The Spencer Mfg. Co.  
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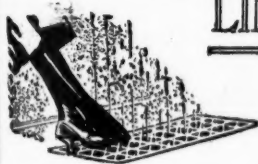
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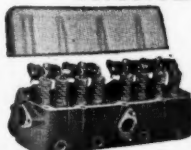


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The remarkable showing of the Fronty-Ford in the 500-Mile Race at Indianapolis May 30 was due solely to the performance of the Frontenac Cylinder Head. This Head is adapted for use on your Ford car by its designer and builder, Arthur Chevrolet. Write for FREE Catalog. Book, "How to Build a Fronty-Ford," \$2.00; free with orders of \$50.00 or more.

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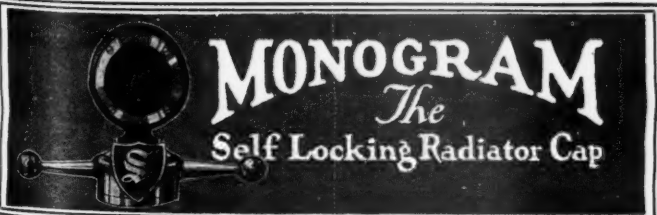


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The  
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"The Best-Equipped Shop  
Gets the Business"







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supplied for ANY MAKE of car. Easily installed. Golden repair opportunity. Write for price list and BIG DISCOUNT.

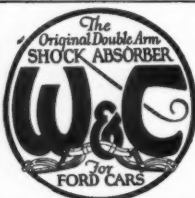
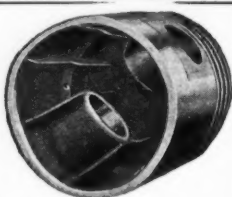
Green Engineering Co., Dayton, O.

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on  
**FOSTER PISTONS**

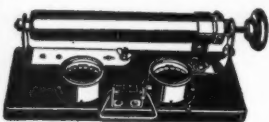
Our line covers over 500 makes of cars, trucks and tractors.

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and Your Jobber Will Give You the Most Successful Time-Tried Shock Absorber for Fords  
W. & C. Shock Absorbers Sell  
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**TEST YOUR BATTERIES**  
by the Chart Method. Something New. Send for free booklet, today.

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All types and sizes of radial (single and double row), thrust, and angular contact bearings, for new or replacement work.

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## GENERAL ASBESTOS & RUBBER COMPANY



## GARCO

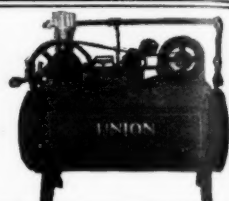
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## For Unusual Service

Union Air Compressor, Union for Service, Union for Strength, Union for Reliability. Built by Union Equipment Co., Butler, Pa. The best machine on the market for the money.

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—WITHOUT PULLING THE MOTOR  
THE C. A. ADJUSTABLE CENTER BEARING CAP corrects Ford crankshaft end play and sets magneto for highest efficiency without removing the motor. Easily and quickly installed. Guaranteed for one year. List price \$3.75. Ask your jobber or dealer or write us direct.

ADJUSTABLE BEARING CO., Inc.  
Dept. M. Brazil, Indiana



There is a Harvey Steel Disc Wheel in the various styles which we make for each size of car at interesting prices.

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Rim & Wheel Co., Inc.  
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## WEL-EVER OIL CONTROL PISTON RINGS

Less Oil and Gas—from WEL-EVER equipped units. Its oil control feature is guaranteed to stop oil pumping, prevent spark plug fouling and reduce carbon formation.

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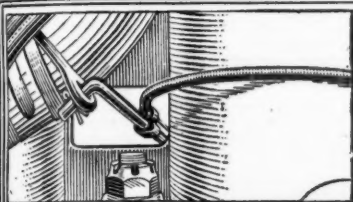
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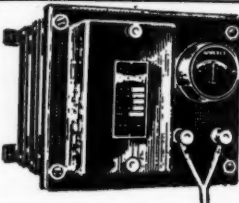




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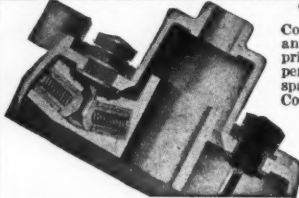
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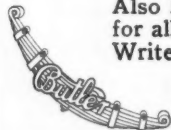
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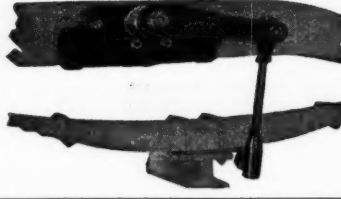


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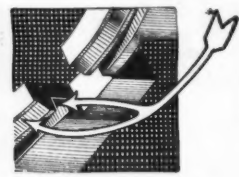
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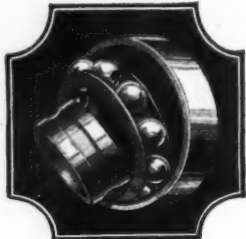
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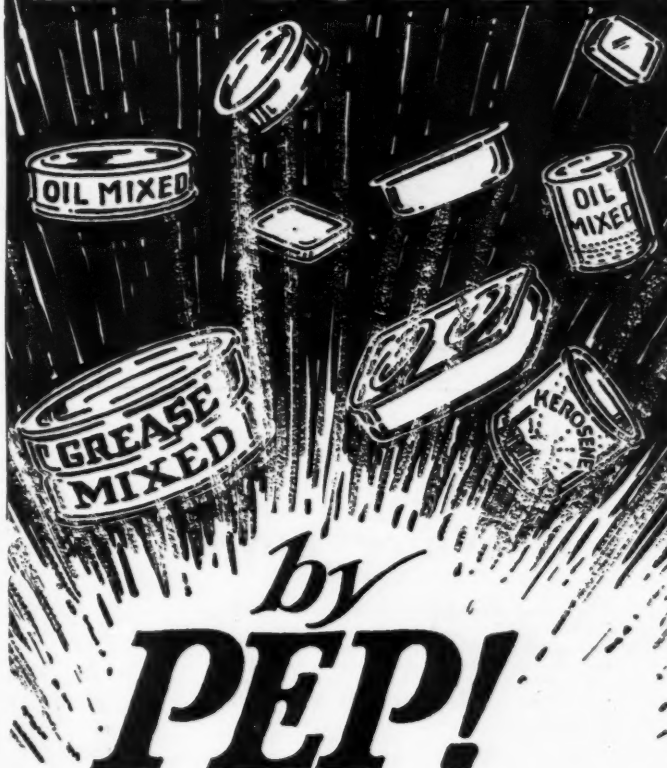
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did it!

PEP proved that grease and oil-mixed compounds do not grind valves nor lap pistons fast enough. PEP actually does a better job in half the time—just because it is the *only* grinding compound that contains *nothing* to slow it down.

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N. Y.

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**Pep Valve Compound** ☐

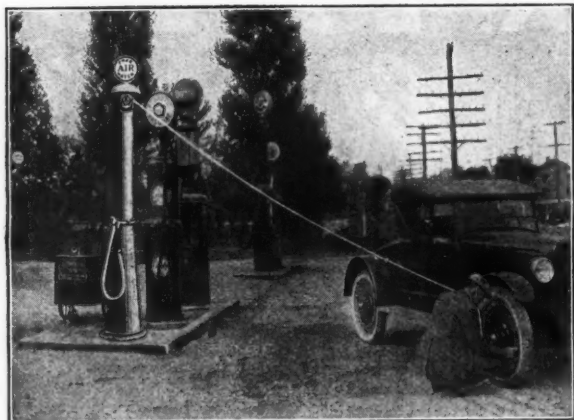
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Check free samples wanted

Write name and address in margin in pencil in

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You can buy the finest MANLEY Air and Water Service made for as little as \$48.50. It's our No. 750 DeLuxe Model. It is tall, attractive, good-looking, matching its appearance with that of any curb-pump it stands next to.

Carries 23 ft. of air-hose, enough to reach over top of any car. Saves its cost in hose, as hose never need touch ground or get in mud and oil. Top pulley swivels, avoiding kinking, twisting, scraping.

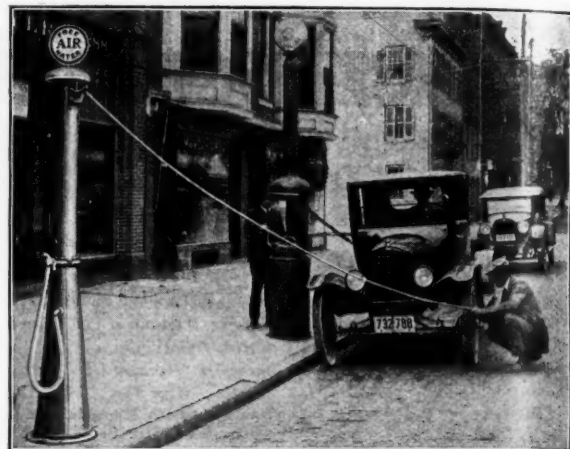
When the hose is pulled out, the weighted pulley is raised, and as soon as released it is pulled back again by gravity and cushioned by a spring. Absolute simplicity. Trouble proof. The weighted pulley is guided by a square end to keep the hose in proper position.

Topped with an attractive sign, interchangeable with an electric-lighted globe. Outer covering of heavy gauge sheet steel. Furnished with all piping installed and ready to connect at unions in base. Highest class job throughout.

Send for Manley catalog on this and 24 other items of garage equipment. Ask any jobber handling Manley Equipment and insist upon getting it.

MANLEY MFG. CO.  
York, Pa.

**Manley**  
Garage Equipment  
MADE IN YORK PA.



**AIR SERVICE ONLY.** For inside use. Saves floor space. Mounts on wall or post. Keeps hose off floor and pays for itself in hose saving. Carries 23 ft. of best hose. Height 8 ft. 4 in. The price is a big feature, \$19.50.



### ELECTRIC GLOBE

This globe replaces the regular metal sign at a slight additional cost and can be installed at any future time in five minutes. All Stations leave the factory with wires in place ready for the Electric sign.

Inside View

# Proof which comes with Every Mail

## ALTOONA, PA.

"I am more than pleased with the performance of my Stutz Six Sedan. The word pleased is too mild to express my appreciation of the best performing car I have ever owned."

C. B. KEARNEY, 1016½ Green Ave.

## ANDERSON, IND.

"The Stutz Six is beautiful, runs smooth as a boat, extravagantly upholstered, economical in gasoline consumption, has all the speed needed and attracts universal attention."

THOS. N. STILWELL, 824 Main St.

## ATHENS, GA.

"The faster you go the better the Stutz Six rides. My mileage is about 18 miles per gallon around town. It is the best doctor's car I have seen. I am delighted."

DR. A. B. PATTON

## BENTON HARBOR, MICH.

"Every mile that we have driven our Stutz Six has been a mile of pleasure. It is a very responsive car, picks up quickly in traffic and has power which takes the hills without shifting gears."

C. A. BEEBE

## CHICAGO, ILL.

"The more I drive my Stutz Six Roadster the better I like it. It has all the power and speed in the world, easy to handle and very economical to operate. . . . I think the word Stutz stands for real motor cars."

WILLIAM L. JOHNSEN, 29 S. LaSalle St.

## CLEVELAND, OHIO

"I am perfectly pleased with the performance of my Stutz Six. Have been able to pass every other car on steep grades without taxing the capacity of the engine. Find that I have an advantage over cars of other makes in picking up, both in city and country driving."

J. HOYT CUMMINGS

## COLUMBUS, OHIO

"My Stutz is the best car I have ever driven. As to the mileage, I get 20 miles to the gallon."

U. E. KINER, 986 Denison Ave.

## DENVER, COLO.

"The performance of the Stutz Six is beyond any question of doubt the most satisfactory of any car I have ever driven. It has worlds of power, it is easy to handle and rides as comfortably as any car on four wheels."

JACK PAYMENT, 1634 Broadway

## DULUTH, MINN.

"Words cannot express my satisfaction with my Stutz Six. Am more than pleased with it. Only sorry I could not have had one long ago. Nobody can explain what a Stutz Six is. They have to drive one to find out. It is a wonder."

C. J. GILLES, 183 E. Boulevard, Morgan Park

## EUCLID, OHIO

"The Stutz Six surpasses all our expectations. It is a wonderful car in every respect. With the lightest touch on the accelerator she fairly flies. Would not trade our Stutz Six for any other car we have ever owned. Get more than 15 miles per gallon of gas."

MRS. MADELEINE H. MOYER

## EVANSVILLE, IND.

"I have driven and owned a number of cars but must say the Stutz has given me greater satisfaction and it will be a pleasure for me to recommend it."

ERNEST G. TIDRINGTON, 420 Chestnut

## INDIANAPOLIS, IND.

"I wish to go on record as a highly pleased Stutz owner having lately purchased a Stutz Six Sedan, it being the twelfth car I have owned. To me is has all the qualities of a perfect motor car—correct size body, comfortable, easy riding, a wonderful motor of surprising flexibility, and with reserve power in abundance. Never before have I been so well pleased with any purchase."

F. E. GATES, Gates Mfg. Co.



The Sign of the Genuine

## STUTZ SIX PRICES

Touring Car . .	\$1995
5-Pass. Sedan . .	\$2350
Sportabout . .	\$2550

## LOUISVILLE, KY.

"My new Stutz Six is easily handled; is very comfortable; has plenty of power. It attracts favorable attention."

E. H. M. BOONE, 303 W. Jefferson St.

## NEW YORK CITY

"Have driven a great many cars, having owned nine myself, and must say that I have never experienced the pleasure of driving that I realize in my new Stutz Six. I do not see how it was possible to build such a car for the money."

SIDNEY BARE, Jr., Gedney Farm

## PHILADELPHIA, PA.

"The Stutz Six has a smooth and fast getaway with less need of changing gears than other cars. Very easy riding, quiet engine, handling of car is light and rapid. Use little oil and comparatively small amount of gas. Its speed in picking up facilitates quick action in traffic. Especially good on hills."

H. D. ALLMAN, Bellevue-Stratford

## PIPER CITY, ILL.

"Am more than well pleased with my new Stutz Six. There is no hill too steep or no mud too deep for the Stutz to go through. Nothing can make the Stutz Six back up. I am satisfied."

K. B. HAWTHORNE

## PITTSBURGH, PA.

"The Stutz Six is by far the best car that it has been my luck to possess. The car is very easily handled, the riding qualities are pleasing and as for power, the way the machine goes over the hills is a delight."

JOHN M. RONEY, Vanadium Metals Co.

## PORTLAND, ORE.

"Have owned a number of cars the past 18 years but have never owned one or ridden in one that surpassed the Stutz Six for all around motor car ability."

FRANK E. WATKINS, 252 Stark St.

## PROVIDENCE, R. I.

"Have just returned from a 1,275-mile trip to Canada in my new Stutz Six Sedan. I averaged 18 miles per gallon and one gallon of oil was more than needed. Took every hill on high, including the famous Lebanon Hill between Pittsfield and Albany, going over top of this hill at 35 miles per hour."

H. L. FINKLE, 95 Fountain St.

## RAPIDAN, VA.

"Gasoline consumption averages about 17 or 18 miles. I am highly pleased with the new Stutz Six Sedan."

R. M. BRADY, Horseshoe Farm

## RED WING, MINN.

"We are more than pleased with the performance of our Stutz Six. Plenty of speed, power and easy riding. I have owned four other makes of cars so should be a good judge."

PAUL EAMES

## ST. LOUIS, MO.

"The Stutz Six has wonderful pickup. It ranks with the highest class automobiles of today and the refined and artistic finish throughout places it in first rank."

WM. REIMANN, Vice-President  
South Side Trust Co.

## SPRINGFIELD, ILL.

"The riding qualities of my Stutz Six are superb and the gas consumption averages about 18 miles per gallon. . . . The pickup and hill climbing ability are so superior to my fondest hopes that I find the car to be the best I have ever driven."

DR. DON DEAL, Deal Clinic

## SPRINGFIELD, OHIO

"Having just completed a 2,300-mile trip to the White Mountains and Eastern Coast I feel that I am in position to give you facts concerning the Stutz Six. The car made 70 miles per hour with no vibration. The pickup is such that it is not difficult to drive through the most congested traffic. It was no strain to run 350 to 400 miles per day. Oil consumption practically nothing."

A. B. DAVIS

## TOLEDO, OHIO

"I own a Stutz Six, the most wonderful car in America. It climbs all the hills on high. Averages 18½ miles to the gallon of gas. Very comfortable. The Stutz is the only car for me."

H. B. PEREIRA, Ward Bros. Co., Inc.

## WHEELING, W. VA.

"I am covering from 18 to 20 miles to the gallon of gasoline. The performance of the Stutz Six and its ease of handling are all that I had expected and my anticipations of the speed, power and stamina have been fully met."

W. H. TRUSHEL, Jr.

## ZANESVILLE, OHIO

"I find my Stutz Six very easy to handle in all places. The gasoline mileage is very good."

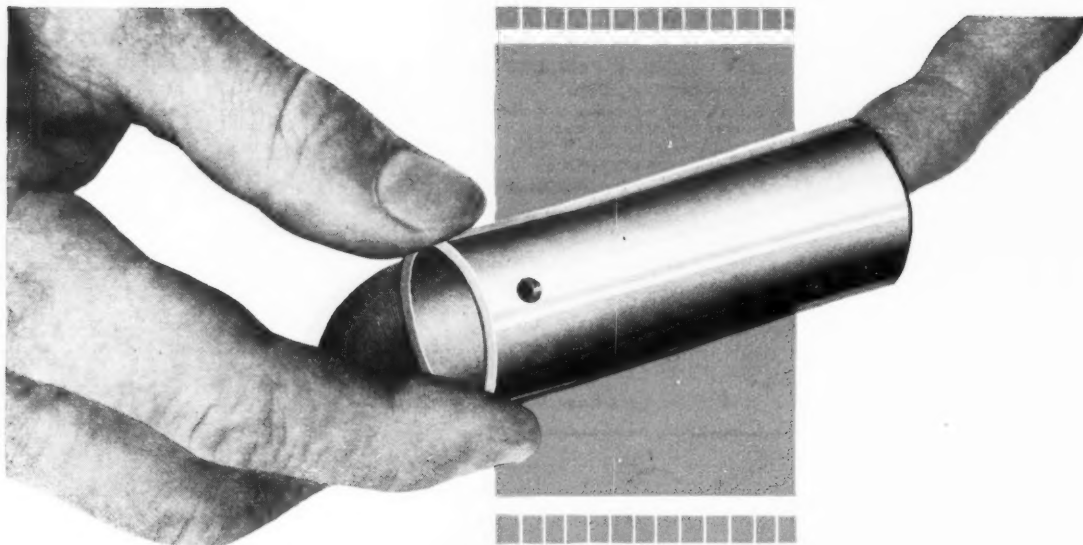
MRS. PEARL H. RAILE, 364 Congress

It's a Great Car

# STUTZ SIX

STUTZ MOTOR CAR COMPANY of AMERICA, Inc., Indianapolis, Indiana  
Builders of the ORIGINAL and GENUINE Stutz Motor Cars





## Appearance Tells You Nothing

On the outside all piston pins look pretty much alike. To determine how good they are you must know just how they are made. In no other part for automotive engines does quality of raw material and accuracy in manufacture play a more important part.

Below, we tell three important facts about GILL Piston Pins. Note that the same high standards for which Gill Piston Rings are famous are adhered to.

# Gill Pins

Made from solid bar stock. Every pin conforms strictly to engine manufacturers' design and steel specifications. Every shipment of material must pass a strict metallurgical test. Three separate heat treatments produce a hardness which a scleroscope test shows to be 70 to 90 degrees. The core remains soft. Loose inside scale is removed by sand blasting.

Our grinding limits are two-tenths of one one-thousandth of an inch (.0002) for taper and roundness and one half of one one-thousandth (.0005) for size. This absolutely assures perfect surface contact. Gill Pins can be fitted quickly by one setting of the reamer. The most accurate and sensitive gauges obtainable are used in the inspection of every pin.

The same service for which Gill Piston Rings are noted can be had in connection with Gill Piston Pins. Complete stocks of standard and oversize pins for all engines are carried by jobbers and dealers in all sections of the country. In addition there are thirty-one Gill branches located in principal cities. You can always get Gill Piston Pins quickly.

*Write for a complete price list and specification book.*

### GILL MANUFACTURING COMPANY

8300 South Chicago Avenue, Chicago



**Gill**  
Interlocking Joint  
Piston Ring



**Special**  
Oil Wiper  
Piston Ring



**Servus**  
Step-Cut  
Piston Ring